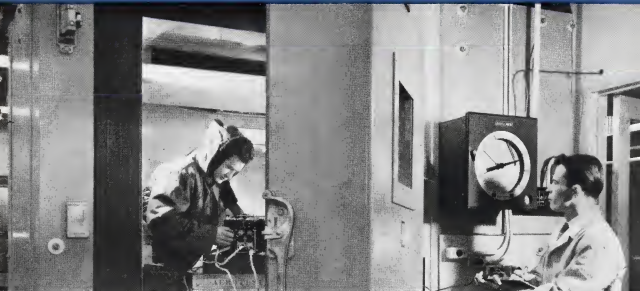


# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

July 30, 1951

50 CENTS



## Even A Polar Bear Would Shiver!

Behind this foot-thick door is one of the world's coldest places—a room where the thermometer often reads 90° below zero F.—where a polar bear would need an *extra* fur coat to keep warm!

In this rigorous, arctic-type “weather,” Honeywell Autopilots, Electronic Fuel Gauges and other important equipment are put through their paces regularly—to prove they will operate dependably in the most taxing conditions nature has to offer.

The temperature of this room can be raised to 200° above zero F.—to test Honeywell equipment in worse-than-desert heat.

Other chambers in Honeywell's Environmental Laboratory subject controls to extreme humidity, sand, dust, vibration, fungus and salt spray. Quality standards are the highest. Honeywell designs its controls to perform their life-protecting duties *perfectly*—wherever our air forces fly.

These environmental tests are just one phase of Honeywell's continuing research on aeronautical control problems. We expect not only to continue, but to expand this research program—because *automatic control* is such an important part of aviation progress. And *automatic control* is Honeywell's business.

AERONAUTICAL DIVISION

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**Honeywell** *Aeronautical Controls*



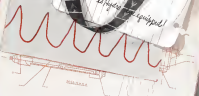


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Burbank, California

*every fighter  
of bomber &  
every transport  
is Hydro-Aire equipped!*



*Research is the Reason!*

**B.F. Goodrich**



## New B.F. Goodrich tire outwears all others in airline tests

A NEW IDEA in aviation tires, designed to give longer service life, has been introduced by B. F. Goodrich.

Instead of the conventional ribbed tread, the new tire has rows of "Diapirs"—round indentations in the rubber.

B. F. Goodrich engineers had two things in mind in developing the new design: (1) provide better distribution of the load, and (2) reduce exposure to road cutting.

First airline to test the new BFG Diapir tire was Braniff International

Airways, who furnished the photo above. Airways tire life improved so much that they have standardized on the new tire throughout their entire fleet.

Fourteen other airlines who have tested the B. F. Goodrich Diapir tire report the same results: the new tread outwears all others used. And five airlines in addition to Braniff have made the new tire standard equipment in the sizes used—on DC-3s, 4s and 6s. Still more airlines are now starting to switch.

Tooling up for production of the Diapir tire in four additional sizes is now under way at B. F. Goodrich.

The new, longer wearing Diapir tire is the latest "first" in aviation tires from B. F. Goodrich, the leader in rubber research and engineering. The B. F. Goodrich Company, Akron, Ohio.

**B.F. Goodrich**  
FIRST IN RUBBER







More Revenue Airline Miles In The U. S. Are From With  
Texaco Aircraft Engines GE Than With Any Other Brand



## SOUTHERN AIR SERVICE builds business with TEXACO

● G. G. Cary, of Southern Air Service, Pensacola Group, Aircon, St. Petersburg, Florida, knows the value of service and quality products. In addition to his large business with non-scheduled airlines engaged in maintenance contracts with South America and Africa, Southern Air Service obtains many private flyers. Attached to Florida's finest golf course hotels, the hotel where every return service and accommodation is available. Since 1915 Southern Air Service has "kept its flag" with Texaco Aviation Products exclusively.

● Like so many fixed base operators that are "going places," Southern Air Service finds that its own line service plus Texaco's top-quality aviation products pay off. Texaco means better business because it offers a complete line of fuels and engine and air frame lubricants — all designed to assure maximum operating efficiency.

Texaco Aircraft Engine Oil is just one example of Texaco's superiority. America's most professed aviation oil, it keeps engines clean, running, full power, dependable performance, and lower maintenance costs.

A Texaco Aviation Representative will be glad to give you full particulars. Just call the nearest of the more than 2,000 Texaco Distributing Places in the 48 States, or write The Texas Company, Aviation Division, 135 East 42nd Street, New York 17, N. Y.



## TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY

## NEWS DIGEST

### DOMESTIC

Personnel and executive strength on parts 10,000 lb. empty airplane weight and range, when Assistant Air Force Secretary Gilpatrick warned negotiators for the company and UAW-CIO that the Air Force might have to take further action to end the three-year-old strike which was cutting heavily into defense production.

Adm. Forrest P. Sherman, Chief of Naval Operations since November, 1949, died of a heart attack in Naples, Italy on July 25. He was 54 years old.

Hilmer Hansen, swept-powered jet expert, contributed an emotional address to the category by flying at a mile a minute of better than 7,500 ft. over Los Angeles, Calif. Pilot Bruce Jones flew the Hornet.

W. Walter Kellett, 59-year-old president of Kellett Aircraft Corp., and a director and former board chairman at Republic Aircraft Corp., died July 22.

Cessna's Fast Worth division \$270,000 jet engine last stand in scoring competitors. Two aircraft with low test two engines came. The central reason between the jets is indicated by two foot thick concrete walls. Windows are heavy, dark butler glass plus an extra thickness of safety glass. Walls fan out in front to deflect flying objects and allow room for propellers when turbo-prop are forced.

Nearly-Nine 5th annual all-convict busway/railroad in one is scheduled for August 15-19. Fifty planes will fly from Santa Ana to Detroit via Fort Worth. Total distance is 3,145 miles. Stock market places are restricted to 100 lbs. flying will be during daylight hours and wind.

USAF is shifting the gun and radar of a lightest most wing (using the F-104 Thunderbolt) across the Atlantic by MATS. Simultaneously, a second group will be returned from England. Purpose of the transfer is to provide 99-day engine training program in European theater for USAF units C-74, C-97 and DC-4 aircraft will be used.

Fuel & Whitney Aircraft has limited commercial production of R-3500 Double Wasp engines because of heavy military demand. Commercial production of the R-3500 is now completely absorbed through June 1951. Despite engine has been reserved for several spare parts requirements.

Alcoa's Cleveland huge plant strike (Aviation Week, July 23, p. 15) is covered offered USAF aircraft only last week when Assistant Air Force Secretary Gilpatrick warned negotiators for the company and UAW-CIO that the Air Force might have to take further action to end the three-year-old strike which was cutting heavily into defense production.

### FINANCIAL

American Airlines reported net income of \$6,512,867 for the first six months of 1951, about three times that for the same period of 1950. Total income for the 1951 half was \$74,945,500, highest for any six-month period in the company's history.

Pacific Air Lines Corp. recorded its highest sales volume for any 18-month period in 1951, when its gross sales reached \$1,294,629. Cost of sales was over \$10 million.

Northwest Airlines reported net earnings of \$47,593 for six months ended June 30, compared with loss of \$3,418, 196 in same period last year. Gross operating revenues were \$21,291,546 compared with \$22,025,545 revenues last year.

### INTERNATIONAL

Royal Air Force is sending four Starboard flying boats on a grand tour from the planes will spend four days at Norfolk, Va., during the 18,700-mile tour. A U. S. Navy ship, temporarily attached to the RAF will fly by one of the planes on the tour.

D. Naper & Son, Ltd. will build a new factory to produce Rolls-Royce Avon engines for the Canberra. Construction will start in the fall. Plant will be on a 70-acre site near North, Lancashire. Total employment is expected to reach 3,000. It is rumored that Rolls-Royce is planning construction of three additional factories in Scotland to produce the Avon. Details on the construction are not yet available.

Manning Canadian-Pacific Airlines DC-4, carrying 15 persons requests from Anchorage to Tokyo, is believed lost somewhere in the Aleutian Islands. Four radio signals were heard, but shortly after, faded. They were not picked up again until the wreckage was sighted in the vicinity of the airplane wreckage.

## Glideslope Receiver TYPE R89M

C.A.A. Approved

Designed for 2 or 4 channel operation, the Avionics Receiver approved Type R89M is intended as a replacement for, and a replacement with, the modified R118. — Very standard commercial and military electronic Avionics.

High shock ability incorporated. — Standard in terms of safety and shock resistance are in compliance with Radio Technical Committee for Avionics specifications. Standard frequency range 220-225 Mc. Weight 12 lbs. 4 oz.



## TYPE R89M C.A.A.T.C. 484-A

2-channels operating standard 2 or 4 channels when order 220.00



## ADI INDICATORS\* C.A.A. Approved Types

Model ADI for 1/2 inch dial, 5 degree scale graduation — C.A.A. TC 484A \$110.00

Model ADI for 2 1/2 inch dial, 1 degree scale graduation — C.A.A. TC 484B \$179.00

Model ADI for 2 1/2 inch dial, 1 degree scale graduation — C.A.A. TC 484C \$225.00

Available for immediate delivery. \*Interchangeable with commercial types.

## AVIATION ACCESSORIES

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ACCESSORIES CORPORATION

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 (IN) WHITES CALIFORNIA • SALLAS TEXAS • TOSIENTE DARGON  
 DARGO

**Slack Airways** withdrew its proposal to lease the equipment of U. S. Airlines after the Air Force elected to seek release.







IN THE NEWS

## SERVICE

Getting top satisfaction from jet engines requires many techniques. Here are a few of the ones used by General Electric to help the Air Force get maximum use from its J47 engines.

To provide immediate service for General Electric engines, more than 30 G-E Service Shops are placed strategically around the country. Four of these shops are currently handling aircraft gas turbine work, more can be adapted as required. Skilled technicians provide rapid and complete repair and overhaul facilities.



At an Air Force base, a G-E representative shows Air Force personnel some fine points of jet engine servicing. To back up this field training, famed G-E jet engine schools have been functioning since 1942. Courses are now presented in fundamentals, overhaul, flight test engineering, and line maintenance.

For quality products and dependable service, call on the company that pioneered the aircraft gas turbine industry. Telephone your General Electric engine specialist or write General Electric Company, Schenectady 5, New York.

AIRCRAFT GAS TURBINES

**GENERAL  ELECTRIC**

## WHO'S WHERE

### In the Front Office

**John M. Kegan** has been designated assistant to the president of Armstrong Aircraft Co. Kegan formerly was vice president and director of military sales for Douglas Aircraft Co.

**A. H. Benckiser** has been made a vice president of Washington Pump & Machine Corp. and will have overall responsibility for the sale of the firm's entire line of pumping equipment.

**Thomas C. Conroy** has been named vice president in charge of scheduling, planning and production for Century Engine Corp. Conroy, who is well known in manufacturing circles, joined Century's staff last year when he had been director of programming and planning.

### Changes

**Edward F. Boland, III**, has been appointed manager of the new Pratt & Whitney Aircraft launch plant at North Haven, Conn., scheduled for completion next February.

**John H. B. Sullivan (JNS, Ret.)** has been designated manager of Chicago plant of Fairchild Aircraft division.

**Charles F. Sisk** has been appointed sales manager of the Lincoln Aircraft division of Hughes.

**John C. Beckwith** has been made chief engineer of Douglas Aircraft's Long Beach division, succeeding the late Fred J. Swenson, who died July 7.

**Vernon C. Gorman** has been appointed general manager of Collins-McIntyre Corp., an Atlanta, Ga., processing division of Bellco, N. Y.

**George H. Brinkley** has moved Newberg Aircraft to manager of its new sales and distribution.

**J. J. Cannon** has moved up to director of production for Kansas Aircraft Corp. Robert Williams became production agent and Donald Gumpert has taken over as technical coordinator. A. G. Odell has been promoted to industrial relations director. E. G. Cannon has been named to become Kansas' production manager. E. F. Gumpert becomes technical engineer and En. J. H. Gell has been appointed chief of construction design.

**B. A. (Bud) Brundage** has joined the Aircraft Engine division of Ford Motor Co., as superintendent of field assembly. Glen M. Reed, formerly with Galle Aircraft Specialists, has joined Aviation Supply Co. N. Y. C.

**James W. Marston** has been promoted to general sales manager of Northcutt Aircraft. Charles R. Blaney has been named up to manager of agency sales. William M. Hansen has been made manager of international sales and Donald H. Neviner has been assigned to manager of sales promotion.

**William A. Fleming** has been designated production manager for Victory Air Line. E. R. Mitchell has been designated director of industrial relations of Vickers Engineering & Mfg. Co., Inc. Dallas, succeeding J. H. Burke, resigned.

## INDUSTRY OBSERVER

►Interesting comparison of U. S. and British jet engines is in the offing as a result of the recent licensing deal under which Commonwealth Aircraft Corp., Ltd., will make North American F-86 Sabre jet fighters for the Royal Canadian Air Force. The Sabreline F-86s will be powered by British Rolls-Royce Avon jet engines, rated at more than 4,500-hp thrust. This will provide a comparison with the General Electric J-47 engines in North American's F-86s. And it will also provide another comparison of the Canadian Avon Orville jet engine with the Avon, since the Orville is going into Canadian version of the F-86 built by Canadair, Ltd. (Orville and Avon also power two versions of the Avon CF-100 night fighter). Commonwealth's F-86 program continues a licensing relationship with North American under which the Australian company has previously built NA-16 trainers (Warriors) and F-41 Mustangs.

►While still American-built Canam Wright J-65 jet engines, will probably be completed in September, it will contain a considerable number of British-built parts. Canam-Wright is getting its supplier program for the J-65 components well organized, but some engine components may require a production cycle of two years or more.

►Possibility of modifying the nose of the Sikorsky S-55 S-55 passenger helicopter to permit installation of two Alouette 550hp engines, instead of the present single 400hp Pratt & Whitney Wasp, may be considered by Westland Aircraft, the British Sikorsky licensee, to meet the increasing safety requirements. Westland is working in order to consider development of a 53-place W-40 helicopter powered by two Dart or Alouette helicopters engines, mounted directly under a four-blade rotor.

►Use of preloaded metal-to-metal springs in both aileron and rudder control of the C-119B airplane in NACA flight tests has resulted in noticeable improvement in spiral stability of the airplane. The rudders quickly returned to straight and level flight after locks on the rudder and aileron handles all for indefinite periods in smooth or even moderate rough air, without getting into a dangerous attitude. The operation was made (for periods) and small corrective planes.

►An Eds A-1 airborne sensor unit, dropped from an SB-29 nose plane of the Air Rescue Service, is being in Korea food rescue work. But was parachuted from the plane by its 140-lb diameter chute into a flooded field, after being flown down by the Air Force. The unit, 1,000 miles away, ship under the SB-29. The 50-ft boat carries clothing and provisions for 15 survivors and has a 50-hp outboard engine.

►Pittsford Helicopter Corp. is now subcontracting 70-75% of the dollar value of its H-19A utility helicopter being purchased by Navy and Army CR the contract, 97% paid to profit balance. This contract with a reported aircraft industry average of 50% of total dollar value going to subcontractors.

►First four flights in the new Bell X-5 variable-roughback wing aircraft plane at Edwards AFB, Mono, Calif., have been successful. Bell Aircraft's chief test pilot, Skip Ziegler, has returned to Mexico after a trip to Buffalo, and will continue the flight program.

►Boeing's latest Starfighter, the KC-97, which includes permanent features for transformation into either an aerial refueling tanker, a cargo carrier, troop transport or hospital plane, is expected to be the new standardized version of the Air Force cargo plane. Using its self-contained power boat, the plane can act as auxiliary fuel storage and tanks in place on the upper deck, and install the refueling boom pod in the plane, where the cargo plane's clamshell air loading doors are normally situated. Fuel and electrical lines are connected to permanent intakes on the airplane. A prototype convertible Starfighter, a KC-97A, recently made the conversion from troop transport to tanker in 5 hr 10 min, with a Boeing crew.



## Air Power Outlook

It won't end now as the military build-up for the next few months.

Joint Chiefs of Staff are scheduled to present a "re-approved" program to Congress in September or October. House Appropriations Committee has tentatively the conference drive on its agenda.

The key questions: How far? How fast? What direction?

The current large on international and diplomatic developments between now and the fall.

But the word in Congress now is that JCS will seek no substantial drops, with most emphasis on air power, but Air Force and Naval aviation. The budgetary impact is expected to require \$20 billion additional, including \$15 billion more to launch USAF on a build-up to 130 wings. They would bring the current 1992 fiscal year defense bill to \$80 billion. That will be hard to sell to the Administration and Congress—unless there is a war scare.

Senators view these developments as pointing to a marked shift from ground forces to mobile strategy and now as power in the composition of the defense stockpile.

• **Buildup of land strength by European nations** is being—more that the Administration wants to shoot. This has been done in the wisdom of guarding U.S. defense to a "holding" of the Continent.

• **U.S. air and naval bases in Spain**, just negotiated for by the late Chief of Naval Operations, Adm. Ernest Sherman, plus bases in Turkey, Greece, and Africa, focus the military importance of the heart of the Continent to the U.S., in the eyes of some planners.

• **Reports that Russia is withdrawing major air bases** on the plateau of West and southeast Germany to the high altitudes.

Between now and the fall, when JCS is due to make its recommended military program, thus in the outlook.

• **Defense chiefs will try to keep the country** from a "misreading" and stir off the creeping lead-in to the defense effort.

• **Congress, taking its time** while raising the defense effort's strength against a let-down, are not expected before October the \$60 billion military budget for the 1992 fiscal year, which started on Sept. 1. House Appropriations Committee—the Budget's first step in Congress—completed hearings last started revenue money requests, then by now, only last week.

It will take five committees at least two more weeks to decide what should and should not be cut. Meanwhile, Air Force and Navy are holding back on their own programs.

• **Aircraft procurement funds—\$11 billion for USAF and \$5.5 billion for Navy—aren't likely to be** increased, but funds for military administrative activities, particularly civilian employees, will be drastically slashed.

• **There will be much talk in the Senate** over funds for a 130-wing USAF program, instead of the 95-wing plan recommended by the Administration. That's no sign yet that the House will take up the issue.

House and Senate Democratic leadership is engaged with counter-attacks to the Republican-led drive for the build-up. Democratic leaders will say Joint Chiefs of Staff are re-opening the military program and Congress should not act until they have presented their final plans this fall.

December leaders on defense plans, such as Rep. Carl Vinson, do not seem to fit the role of seconding Republican Sen. Henry Cabot Lodge and Kenneth Wherry—the two key sponsors for the 130-wing build-up.

Two subgroups on the 130-wing program.

• **Tactical side.** The Left Wherry faction that wants to go all-out for strategic air and opposes the Administration's plan for a ground-based air action to "hold" the southwest of Europe, supports the 130-wing program, even though it emphasizes tactical aviation to the extent of 50 groups authorized for dispatch to Europe.

They're reminding Democrats the tactical air power is what it can be used for U.S. air defense and protection of U.S. strategic air bases around the world.

• **Current situation.** It's going to be put on trial behind closed doors in Senate Appropriations Committee. Several members who look on it as an expensive, unneeded move by the Navy to run its way into the strategic air side plan to give Navy leaders a rough going over on its merits. They want to channel funds elsewhere for air sea aviation build-up into the 130-wing USAF program.

But their drive is not likely to succeed. One reason, based around Washington. They became to carry it out is too open for fear of provoking the powerfully isolated Navy League.

But the specter of an error as will have the full number of the Navy grant that is increasingly pressing against the appearance of "corrupt deals," for the development of long range bomber weapons. The factors reveal that the surprise can be developed to match the B-24 in performance—and it wouldn't require early take-off hours—around the world.

Navy, now barred from the strategic air side, can only try for supplies for cargo purposes only.

## Foreign Airmail Business

U.S. carriers get far more real business from foreign governments than the U.S. Post Office gets to foreign carriers. In 1978 fiscal year—the last for which data is available—U.S. carriers handled 4.5 million tons of foreign airmail, foreign lines handled only 54 million tons of U.S. mail.

But here are some figures that have carriers looking at the situation pessimistically.

• **Foreign airlines charged U.S. mail** over the past Atlantic route for substantially less than U.S. carriers last year. Post Office and Pan American air average \$1.1 a ton mile and TWA an average \$3.8 a ton mile for trans-Atlantic flights. But they charge about \$20.6 for Air France, KLM, Sabena—charged the PO only \$0.6 a ton mile. And two other foreign carriers charged less than that: Korean, \$2.5 a ton mile; Swissair, \$2.7.

• **British Airways charged U.S. Post Office** an average \$22.9 a ton mile for Latin American routes, but charged foreign governments only \$2.5 a ton mile.

• **Chungking to Southern** charged U.S. Post Office an average \$36.5 a ton mile for Latin American routes, but charged foreign governments only \$3.8 a ton mile.

• **U.S. Post Office paid foreign carriers** only a fraction of what it paid British and Chungking to Southern for Latin American routes. Air France, \$2.5 a ton mile; BAA, \$3.3 a ton mile; CMA, \$2.6, Cathay, \$2.8, and LAM, \$1.3.

• **Colonial Airlines charged U.S. Post Office** an average \$21.8 a ton mile for Bermuda routes, but charged foreign governments only \$2.2.

—Katherine Johnson

## Legal Maneuvers Mark ALPA Week

Operations now 'normal,' new leadership says, but receivership is threatened if factions do not agree.

The Air Line Pilots Assn. was back to normal operations last week, including resumption of operations of the United Air Lines despite. Being no possible emergency, refuse with airlines would continue work as before the international wrangle touched off by the board of directors' vote to oust President David L. Beltsche.

The possible emergency was the reported threat by Victor E. Cheney, Victor E. Lucas to recommend a receiver be appointed for the union if a settlement could not be reached between Beltsche and the airlines' choice to succeed him, Clarence M. Saper. A motion would not only control union funds, he would have to get court approval for each contract negotiated. All attorneys concerned, virtual as of labor practice, receive a receivership would wreck the union.

• **One in Court-Super** and his group contended the union was back to "normal operations," and insisted upon a right to be concerned about jet and tailoring pilots and necessary adjustments as per when these planes arrive.

Beltsche was arrested and Beltsche given until today to answer.

That was the only remaining legal action. But it was had enough from both sides. Beltsche, the question would take weeks, perhaps months before final decision, and it would go right to the heart of the matter: the integrity of the ALPA director's action in "resolving" Beltsche.

Beltsche, President-Beltsche stated the action was illegal, that he was still president, that only the members could vote a recall under the bylaws of ALPA (which the director changed).

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## Patterson Sees Stalemate

United Air Lines President William A. Patterson last week described the refusal of UAL pilots to fly bigger, larger DC-9s with out a new working agreement as a "synthetic problem."

United, he said, his pro-union contracts and can meet changing conditions easily.

As he talked with members in Los Angeles, where UAL directors were meeting, the dispute which had led to the current's conclusion of 9,500 miles of route operation.

Answering Wilson July 28, p. 16) was back for consideration by the National Mediation Board in Washington.

Patterson and negotiations with the Air Line Pilots Assn. representing the protesting pilots were stalled with no prospects of solution. The only problem was mileage limitations, he insisted, the pilots were stalled with their salaries.

But he added that the pilots showed no signs of giving up, and he would not budge from his own stand because he believes the pilots are wrong.

He said the pilots would have a right to be concerned about jet and tailoring pilots and necessary adjustments as per when these planes arrive.

Beltsche was arrested and Beltsche given until today to answer.

That was the only remaining legal action. But it was had enough from both sides. Beltsche, the question would take weeks, perhaps months before final decision, and it would go right to the heart of the matter: the integrity of the ALPA director's action in "resolving" Beltsche.

Beltsche, President-Beltsche stated the action was illegal, that he was still president, that only the members could vote a recall under the bylaws of ALPA (which the director changed).

Further, Beltsche's attorney, the action was illegal, that he was still president, that only the members could vote a recall under the bylaws of ALPA (which the director changed).

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cautiously reflects the feelings of the members. Sayon and his legal advisers believe they have acted strictly according to law. But should the court feel that the ALPA board of directors did not conduct its affairs in a fair and equitable manner, the court could find in favor of moving Behrnde. Sayon is confident the membership will support the matter in a manner that can be expected by the court.

Despite Behrnde's objection to the current legal situation, the new ALPA leaders feel it is only this time when they have full undisputed authority to act for the association. They have no doubt at all that the members do not want leadership.

Further, they say, this desire for new leadership is not of recent origin. It was not inspired by the landing of the United Air Lines stricken jet, the landing of Simon Larry Gates, union Washington representative, and several other ALPA officials. Seeds of distrust have been sown over many years and by many acts of commission and omission by Behrnde.

Most of the complaints revolve around Behrnde's resistance to running a one-man show. The new leaders noted that none from over the former president's camp had been asked to join a slate that had been going unchallenged for the years and disrupted the proceedings. And they cite instances of official representation, such as the recent ALPA participation in the Pilot's Advisory Committee. Behrnde attended the first meeting, appointed a delegate for the next meeting, replaced him for the following meeting and so forth, yet never represented ALPA on the European study trip of the group's subcommittee.

Results, ALPA once say, is that no union representative was able to get the complete picture and adequately represent the union.

► **New Methods**—This is the type of administration that the new leaders hope to correct by better leadership. They are not yet ready to spell out in detail what those better methods will be. But Sayon does point out that ALPA membership includes graduate association members, at various educational levels. This knowledge can be utilized to promote the aims of the union. He expects to use these men in ways that are considered in future efforts.

Behrnde's attitude towards that can be summed up. The union's affairs never have been as better shape. Now it is a complete, self-contained, respected union with a clear plan for the future both to get into it.

He has not resigned and he has disavowed in writing authority the state union issued although, on his behalf he

Dispute (Aviation Week July 21 p. 16), which gave the impression Behrnde had given up the fight. Behrnde has removed his office at ALPA headquarters, returned to town over the 10 to 15 miles and in other ways seeking a settlement of the dispute. He feels to do so would indicate success of Sayon's group have legal basis.

While discussions with Behrnde's administration goes back a number of years, the spark that touched off the revolt was the report by the special five-man investigating committee appointed by the executive board to judge

Behrnde, in his capacity as president, over the establishment of the inter-airline group. Even when the report was turned in, Behrnde perhaps could have retained his title as president if he had preferred to abide with reforms recommended by the investigation. When he refused to do this, the executive board felt it had no alternative to proposing his recall.

The investigating committee never mentioned changes to accounting practices, completion of the ALPA building, or concrete connection of five pilots, regional offices and the representation of national headquarters.

## CAB Shifts on Miami Interchange

Board rescinds National-Panagrah pact, but puts Brasili in the act; Grace sells NAL holdings.

Pan American Airlines' board of directors, Pan American Corp., Airways, but a sharp blow at Panagra—had been long on both PAA itself and Panagra.

Civil Aviation Board gave PAA its stamp of approval for the interchange traffic for Latin America. But, in doing so, the Board decided to give Brasili Airways, competitor in Latin America, of both PAA and Panagra a move step to drive extra traffic.

► **Results in Growth**—The two CAB actions added up to this:

► **Through routes from New York to Buenos Aires**, connecting the eastern routes of South American airlines, scheduled, over the routes of Northern Air Lines, PAA and Panagra, is set for a long while PAA and Eastern Air Lines backed the Panagra deal with National.

► **Brasili Airways can now compete with PAA and Panagra** for a connecting link, at Miami-National or Eastern-to-late eastern scheduled traffic into its South American network.

► **Results in Particular**—Specifically, the Board's action, both temporary procedure demands on a proceeding concerning all the non-union in the establishment of through service from the eastern U. S. to western South America.

► **The first order rescinded** temporary approval of a Panagra-National interchange agreement and an amendment to a PAA-Panagra agreement which, taken together, would have provided complete service between the north eastern part of the U. S. and points in South America through Panagra aircraft over the routes of the three carriers.

The interchange agreement was not at all a plan to be worked out for Panagra with National by W. R. Grace & Co., which shares equally with Pan Am in Panagra ownership. PAA was an unwilling participant. In approving

them in April, CAB presumably thought the carrier still favored them. But the key to PAA's endorsement was the two agreements negotiated by NAL, an option by PAA to acquire 50% of National's stock, a National-PAA interchange agreement, and a deal to operate over National's New York-Miami route under charter to National National, with 17.4% of its stock held by Grace, backed down on these.

► **The Outcome**—As a result, PAA launched its drive against the Panagra National interchange which would permit Panagra, influenced by W. R. Grace Co., to tap the link New York-Miami, and thus to compete with National. Although PAA's stock, a 50% PAA and 50% Grace-owned, Panagra's president, Antonio Siles, a Grace representative, has taken over direction of the airline.

In the background is strife between PAA and Grace directors on Panagra's PAA action aimed to keep Panagra in status subsidiary to PAA operations and the Grace action, wanting full legal airline status. But the carrier is an appendage of the Grace company.

The Panagra National interchange, approved every such of the way by PAA, can now proceed.

► **Grace-Panagra**—CAB's cancellation of its approval "National and Panagra might, of course, after protracted judicial controversy, establish their right to operate the agreement as it now stands. However, it is clear that whatever the judicial outcome might be, there is no chance of the interim service by a cooperative effort of the air carrier concerned which was contemplated by the agreement.

The interchange agreement was not at all a plan to be worked out for Panagra with National by W. R. Grace & Co., which shares equally with Pan Am in Panagra ownership. PAA was an unwilling participant. In approving

of which Panagra and National management previously were aware.

Grace officials said the action was taken to clear the way for Panagra's interchange arrangement with National. Chairman predicted that the reform would end the mystery launched recently by CAB at PAA's, pending to learn whether Grace could be considered as having control of National. The Civil Aeronautics Act has been interpreted as forbidding the control of an airline by a controlling company. The Grace Line is a W. R. Grace & Co. enterprise (Aviation Week May 14, p. 40).

► **The second order** granted Brasili a Miami stop on its Havana-Houston route that looks into its South American system, but required Brasili's bid for connection from Miami to Washington and New York.

CAB pointed out that the big share of eastern U. S. traffic to South America is now moving over the PAA-Panagra system. During a first period, 15 times the traffic went from Miami over the PAA-Panagra system, said the CAB. But since the Brasili system, CAB said it intended to route the two airlines' combined traffic.

Brasili's problems—National Brasili has been operating out of eastern Florida. National has never made interchange connections at Miami with Brasili flights. Passengers have had to get up with long stopovers. In all things, they have had to undergo two separate security checks, one at Miami and then Latin America destination point. Passengers embarking from Miami are subject to only one screening of their destination. Brasili complained that a passenger never at Miami, thus since over a National Brasili routing.

Meanwhile, with the order, CAB called a pre-hearing conference on the interchange, one for thorough service from the eastern U. S. to South America—the so-called New York-Boston case—and announced that hearings would open before CAB chairman Thomas W. Ryan next Friday (see p. 16).

► **New Agreement**—Meanwhile, here's the changed pending position:

► **Brasili can now plan** for an interchange with Eastern as well as National.

► **Brasili, though still not a full, is shown** a likelihood of becoming a full interchange carrier, with a Miami as a terminal point, or pick up traffic at Miami to feed into its domestic points. It is hoped, too, from engaging in local Miami-Houston service in 1959, and subsequently extend to national routes to the Argentine in force for two years.

Following last time of date as CC at the North Atlantic Air Commission is scheduled to the U. S. in 1959 as Assistant Secretary of Air State for Interchange. Though said elsewhere feel such a move is unlikely.



## Quesada Quitting In Policy Squabble

Gen. Edward R. Pettit, USAF, said he just completed a two-year assignment as commander of Joint Task Force III, including Atomic Energy Commission's tests at Eniwetok, Atoll in the Pacific, will probably leave Aug. 31, as Air Force spokesman told Aviation Week.

Reports that Quesada had asked for retirement recently because of disagreement with present Air Force policy on the development of tactical air power, as well as dispute about USAF command to the contrary, are unconfirmed.

The Air Force last week officially disavowed published reports stating that Quesada was disgruntled with present policy on tactical air support and said the Secretary of Air Force and the Chief of Staff of the Air Force have recently agreed to give further consideration to the (Quesada's) request for retirement, which he has indicated he intends to submit in the immediate future.

Quesada, 47, made a brilliant record for himself as director of World War II North Pacific Command which, among other missions, provided cover for the Normandy landings. He later became commanding general of the Ninth Tactical Air Command.

► **Wide Background**—He was born in 1915 and in 1939 was a member of the crew of the Queen Mary, a three engine P-40 that flew over San Diego, Calif., in the first successful aerial refueling flight. Quesada was captain at Tufts in Cambridge during the 1930s and subsequently acted as technical adviser to the Argentine air force for two years.

Following last time of date as CC at the North Atlantic Air Commission is scheduled to the U. S. in 1959 as Assistant Secretary of Air State for Interchange. Though said elsewhere feel such a move is unlikely.

equal board on USAF newly offered later was Chief of Technical Planning Committee for the Joint Chiefs.

Before taking assignment with Joint Task Force III, an Air Force spokesman said Quesada was already in complete disagreement with Air Force policy on tactical aviation matters and said that it was for this reason Quesada was given the relatively unimportant reserve job.

Quesada, he said, had exception to his duty and his retirement bid. But the Air Force urged him to stay on. As incentive for Quesada to stay the spokesman mentioned, USAF awarded him command of 11th AF and promised him an important tactical assignment on his return. It has not been forthcoming the spokesman added.

Quesada himself had no comment.

## 'Top 50' List Has 19 Aircraft Firms

Adm. D. C. Ramsey, Aircraft Industries Association president, said Adm. John L. Sperry, USAF, said the aircraft industry is using more than 60,000 subcontractors, of which 97% are small business firms, employing 590 or less workers.

The USAF message came to the chairmen of the Senate Select Committee on Small Business after he had released a report on concentration of defense contracts in industry. This showed that the large manufacturing companies have received 97% of all defense contracts, and that 90 companies have almost two-thirds of the total dollar volume.

Ranked at top two price contractors, in June 1958, were the following firms:

► **Thorne Ball**—General Motors, \$4.5 billion; Ford Motor Co., \$1 billion; Boeing, Aerospace Co., \$600 million; Chrysler Corp., \$500 million; Lockheed Aircraft Corp., \$500 million; Republic Aircraft Corp., \$490 million; General Electric Corp., \$490 million; United Aircraft Corp., \$490 million; North American Aviation, Inc., \$490 million; and General Aircraft Engineering Corp., \$490 million.

Flowers other aircraft companies in the top 50 companies in the order: 11, McDonnell Aircraft Corp., \$290 million; 14, Bendix Aviation Corp., \$235 million; 15, Sperry Corp., \$198 million; 16, Douglas Aircraft Corp., \$172 million; 17, Lockheed Aircraft Corp., \$152 million; 18, Fairchild Engine & Airplane Corp., \$127 million; 19, Bell Aircraft Corp., \$125 million; 20, Aero Manufacturing Corp., \$122 million; 21, Republic Aircraft Corp., \$119 million; 22, Cessna Aircraft Corp., \$119 million; 23, Cessna Aircraft Corp., \$119 million; 24, Beech Aircraft Corp., \$119 million.





## Fletcher Shows Armed Lightplane

Nereid is a series of lightplane competition which are currently being demonstrated to the Army as potential nuclear launching platforms and low level weapons speed ground targets, in the new place Fletcher Model F335. The fighter, which has already been demonstrated to the Marine and General Forces.

Built by Fletcher Aviation Corp., Pasadena, the Defender is powered with a 250-hp engine, and weighs only 1,350 lb. empty. It is equipped with a main engine speed of 166 mph with external load or 187 mph without, and has a 144-mph cruising speed and 40-mph landing speed, its manufacturer reports. Range of the Defender is quoted as 500 mi.

► **External Load**—That is what the manufacturer says the low-wing monoplane will carry in external armament load configurations: two 40-gal Napalm bombs, or two 210-lb bombs, or thirty six 2.75-in. rockets, or twelve 5.75-in. rockets, or twelve 5.75-in. rockets as loaded basic loadings, or four 5-in. HVAR rockets. Each configuration is supplemented by 2,000 rounds of 30-cal. machine gun ammunition fed from two wing gun installations.

Obviously, most of getting in under the 2,000-lb weight limit for Army airplanes, the Defender has a design gross weight of exactly 2,000 lb.

It is up against competition from other small aircraft and machine gun armed planes such as the Yonkers T-14 and Beech T-75 and the even faster Mooney aircraft. More is a military reason.

Selection of either the two-place Beech or Yonkers plane in an elementary Air Force training, might be expected to counter either's design for a small order of armed planes for field units. The Fletcher and Mooney planes have even more specialized and presumably will depend more on their portability in air-to-ground weapon carriers, along with possible use in surprise maneuvers. They have been seen limited use of North American T-6 trainers at armed planes in

## New Big Boy

Convair YB-60, 8-jet,  
weighing B-36 version  
to fly in November.

While Consolidated Vulture's great sweeping eight engines will be later was officially designated YB-60 today by the Air Force, a battle is rapidly developing behind the scenes to bring it into production by November.

The big bomber, now under construction at Convair's Ft. Worth plant, is currently scheduled to make its first test flight in November, according to production at Pratt & Whitney's 10,000 lb thrust class J-57 jet engines are available.

Pratt & Whitney delivered its first J-57 to the Boeing Stearman Co. in June and will deliver a number to Boeing to enable it to conduct considerable test work, have enough jet engine spares, plus the right needed for B-52 installation.

► **At Force Doubtful**—Consolidated Vulture needs a similar engine for its major program for its B-60 program, but Air Force isn't sure that Pratt & Whitney production will be sufficient to meet the full needs of both companies, an Air Force note.

Air Force is now reviewing Pratt & Whitney production schedules and so far is planning to put both Boeing and Convair in an "interim line" in regard to their J-57 requirements, he said, so that each can meet flight test schedules.

The Boeing B-52 was selected as the major production bomber for the Air Force in 1954 and is now in production. The B-52 is now in production.

The ACC action followed publication of the figure is possible in national defense and the civil economy by CAA as the chairman agency, supported by various studies on aircraft use, and by findings of the Air Transport Commission Task Group of National Security Resources Board.

The 1,500-plane figure represents a 1,000-plane increase over the interim figure previously adopted by AGC. While it compares closely to recent core production figures of light aircraft, it is only a small fraction of the average annual production since the end of World War II.

CAA considers a production of 1,500 planes will be sufficient to ensure continued employment of a nucleus of skilled aircraft and engine mechanics.

Industry is asked to work with the CAA to assure that new aircraft production under this program can add only to current and future defense activities and essential civil activities.

conference that the decision was being made before the plane was test flown because sufficient flight experience on the B-47 (smaller counterpart of the B-50) had been gained to warrant ordering B-52 production.

Convair, meanwhile, was pressing for rapid construction of the B-60. Reports are that the plane is fast taking shape at Ft. Worth and that it will be ready for flight on schedule in November if the engines are available.

► **Higher Thrust**—Air Force reports state that several other engines of considerably higher thrust power are now being built and that B-60 installations may require one of these newer engines in some as they become available to qualify. These sources were doubtful, however, that the newer engines would be as efficient producers to permit their great and installation in the B-60 by November.

Forecast of the B-60 in the area as its predecessor, the B-36. Wings and tail, however, are swept back at a 35 degree angle. Lateral tail surface is slightly raised and given a low-chorded figure as seen in profile below the wing—two is each nacelle.

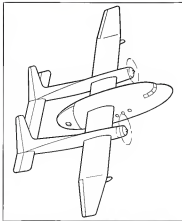
Design performance figures of the B-60 call for a maximum speed of over 10,000 mph, 10,000 mph at a speed of 570 mph, and at an altitude above 45,000 ft. Crew complement is more the same, 11, plus a four-man relief crew.

## C-W Backlog Tops \$1-Billion Mark

New military letter contracts for aircraft and propellers have recently tripled the Curtiss-Wright Corp. backlog since March 31, revealing a backlog of \$1 billion, President Ray T. Hall has announced.

Earlier last Curtiss-Wright is now contracting 60% of its manufacturing program, with over 1,000 subcontracts in 19 states. The corporation is aggressively pursuing the policy commended by the Senate Small Business Committee to spend the work widely to grant a "broad and growing industrial base" to the nation.

The present Curtiss-Wright position as one of the top ten companies holding 40% of the total dollar volume of defense contracts is a marked contrast to the relatively modest volume of business on the books of the company before it entered the jet engine field a year ago, when it got orders for production of British Armstrong Siddeley engines for the country. Its jet engine production then came only as the J-45, developed from the Armstrong Siddeley Sapphire, and the J-570 R-9V core-powered engine.



AVIATION WEEK SKETCH shows how enlarged wing will load on new Fairchild plane.

## USAF Buys Big-Wing Packet

Fairchild C-119H seen as quick answer to Army need; will move 22,000-lb. cargo into front-line bases.

By Ben S. Lee

The Fairchild Engine and Airplane Corp. has been awarded an Air Force development contract for a radically redesigned C-119H Packet featuring a 40% greater wing area. This means bigger payloads, longer range, and slower landing characteristics.

Fairchild's big wing proposal does not put the plane in official competition with specifications issued by USAF for the 25,000-lb payload all-weather transport, but it does put it in actual competition with all planes in its weight class as the major tactical approach to the worldwide and rapid military transport problem.

The new C-119H Packet has been designed specifically to meet Army combat cargo requirements for a plane that will move approximately 22,000

lb of cargo directly into a forward staging area where it can be transferred immediately to trucks.

In this respect it is a competitor of the new Lockheed medium transport turboprop plane which won the recent Air Force competition (Aviation Week July 8, p. 46). But the Fairchild development, making use of many untested features of the earlier Packet, could have a considerable time and dollar advantage in getting into production, over the newly new Lockheed design.

This advantage stems partly from the fact that the Air Force makes transport transportation requirements related to new and relatively untested turboprop engines and expanded the Army's original load-carrying requirement to 25,000 lb for 2,500 mi.

► **Korean Lesson**—New plane requires







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## AVIONICS

### Avionic Advances Revealed by Honeywell

Five devices now being built or developed indicate progress.

By David A. Anderson

Minneapolis—The Honeywell Aero control division pointed to five stock, recently-and widely public news of the results of that inventory. The occasion was the formal opening of the new aeromedical engineering building of the Minneapolis-Honeywell Regulator Co., one of the pioneers in the field of automatic control systems.

The reason for the new building became apparent after representatives of the technical aviation press and local newspapers, radio and television reporters were briefed on the current status of progress at Honeywell's new divisions. Not only is the division actively pushing production and development of five products of its own, plus a substantial amount of research and development work on other projects, but it is also to be a second center of inquiry for the Air Force in avionics.

So, Honeywell is a busy place. This, in single evidence of that during the inspection tour of the shop and test facilities. And the growth of the new division is just as startling as some of the new products displayed here.

In the last four years, for example, Honeywell's expenditures for research and development have increased 500 percent. In the last two years, more power has been devoted to 1947 than was 24 design teams—composed of designers, research and test engineers and the necessary draftsmen and technicians to support the test-and-bake that runs better than 120 with possible increase to about 170 before the end of the year.

Following is a roundup of what these design teams have produced and are currently working on.

• **Control Wheel Steering.** In its present stage, this gadget is an extension to Honeywell's EG autopilot of the true way in service on the B-36 and B-50. Basically, the device—bearing an untidy nickname, "Easy Joe"—enables the pilot to maneuver a plane while the autopilot is engaged. The vick for the pilot feels is only a fraction of the actual force, but to give the airplane from Easy Joe's strength, it has been equipped with its own engine.

This is a somewhat different approach



"EASY JOE" control wheel components (arrows), control panel, master switch not shown

to the problems of automatic flight, where the autopilot is generally clamped with the job of keeping the airplane straight and level. To maneuver a craft under conditions of autopilot in, the pilot must disengage the autopilot and then cope with normal stick forces.

But with Easy Joe, the pilot pushes a little button in the top of the wheel and the system is alerted. Any command within the capacity of the system and the airplane can be made with the button engaged, and Easy Joe helps make the maneuver. After the plane has been warned, releasing the button switches on the conventional aspect of the autopilot again, and the craft goes to straight and level.

The system has been under development for two years, and is still considered experimentally by Honeywell. The small master control panel has been eliminated in the clean installation which makes visible only three cockpit dials: a master on/off switch on the instrument panel, a small cylinder on

top of the control column, and the button on the wheel. The master control panel is built in the control column.

• **Improved Fuel Gauge.** Honeywell developed a constant fuel gauge, currently installed on about 40 types of airplanes, because of the inherent error of float-type gauges. The capacitance gauge measures the quantity of fuel left in the tank electrically, and gives the amount to the pilot in terms of pounds of fuel.

But this isn't what the engine crew needs. It wants to know the fuel amount of energy left in the tank in other words, it wants to know how many lbs. are left. The pilot, on the other hand, would like to know how many minutes he has left.

Getting these answers is quite a problem.

For one thing, the possibility of using different fuel in jet engines means that there are different electrical characteristics for each fuel. And in a special compartment, referred to as FID (Fuel Duration Indicator) has been incorporated



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EIGHT-CHANNEL flight recorder shows performance data as coded traces on paper strip.

in the expenditure gauge. This gives an accurate measurement of the quantity of fuel, regardless of the type.

There is another angle to Honeywell's fuel gauge—fuel-savings. In earlier systems, the pilot needed a gauge for each set of fuel tanks, or a selector switch and a single gauge. In the new system, the totative gets individual signals from each tank, adds them and gives the pilot an instant of fuel remaining.

•CG Control—In the developmental stage is a scheme for control of gravity control. This is important, because the use of that wing action has migrated fuel storage to the fuselage. But emptying of fuselage tanks creates considerable travel of the center of gravity. Honeywell engineers say that with the next step in fuel recording system, the system itself will be automated to control fuel transfer pumps in such a way as to keep the plane in proper balance. One step further is to take into consideration the acceleration or bumps or motions experienced and their effect on CG.

The altitude warning system will give the pilot his remaining flight time. That development is currently being tested.

•Altitude Controller—This little (reference) unit device was originally intended to meet the ANCC's requirements for a stabilized bombing platform. Its major purpose is to keep bombing craft at the drop altitude, rather than have their balloons expand with the dropping of each bomb from the craft.

It functions at an altitude level and controls the autopilot its accuracy, was demonstrated by John Sigford, Honeywell's chief new engineer, who lifted the prototype model of the controller about ten inches off the table. In the system, a sensor, relay, clock, indicating that the small altitude change had been

felt, measured and applied as a corrective to the autopilot.

This control could be applied to jet fighters, one example of use being to maintain altitude on overwater flights, a pilot fatigue problem. Another use, however, could be in helicopters, to control lowering altitude for rescue work.

The second prototype is the warning system for the control, a computer feeds into the autopilot the information obtained from sensitive counterparts of the altimeter and the rate-of-climb indicator.

•Flight Recorder—This is a portable, eight-channel recorder developed previously for testing Honeywell's own equipment in flight. It can be set up in any convenient location and fed information from the control components at surfaces being tested.

Data are recorded on a paper chart, fed through the recorder and read by a pilot. One advantage is that the recording system is portable and can be used in an observer, and construction or other studies as test procedure could be made in flight instead of having to wait for the next photographic records or take extended data to be read and tabulated.

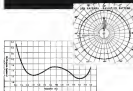
The instrument can be adapted by recording any function whose amplitude, frequency or resistance with time is desired.

•Temperature Control—In this field, Honeywell is getting back to its traditional first line of business. Temperature control of a cockpit is quite a problem, because of acceleration heating of the skin and the venting air (the latter is very compressed). And so a plane can be burning along at high speeds in a subzero atmosphere, and the cabin temperature can be above human endurance.

Although Honeywell does not make venting systems (they make sensing, but control systems) they have devel-



## NEW! VHF COMMUNICATIONS ANTENNA FOR AIRCRAFT



Left is right—Collins 318-1 VHF communications antenna and its VHF communications reference frequency monitor as installed in specially modified test aircraft.

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This is a portrait of the new Collins 318-1 antenna, made expressly for use with the Collins 318-17L two-way VHF communications system. It is designed for the most efficient radiation and reception of vertically polarized communication signals in the frequency range of 118 to 136 megacycles. Note the excellent radiation pattern and standing wave ratio graphed on this page.

The 318-1 mounts externally on the skin of the aircraft. Its mounting base, identical with the Collins type 317-2 mast antenna, greatly simplifies installation especially on pressurized aircraft. Only the rf connector protrudes through the skin of the ship.

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REFRASIL has a surface density of 0.5 lb. per sq. ft. and a nominal thickness of 1/4 in. Pre-laminated sheets for typical jet engine use are only 1/4 in. thick. REFRASIL insulation will not peak down or disintegrate under vibration.

2 Ideal insulation must reduce temperature to safe level for structure and personnel.

REFRASIL can withstand maximum heat with nominal thickness of 1/4 in. and give a temperature drop from high of 1200° F. to low of 500° F. REFRASIL, with without additional vapors to temperatures up to 2000° F. and high temperature shock at 400° F. more, without degradation.

3 Ideal insulation must be easy to install and remove from equipment.

REFRASIL is available in pre-laminated or removable sheets, designed for jet engine applications. Insulating efficiency of REFRASIL blankets is not affected by frequency repeated removal and installation operations.

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Backbone: Ford, the world's largest aircraft manufacturer, uses REFRASIL.

Method: 1. American Airlines and others use REFRASIL for jet engine insulation.

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Method: 4. American Airlines and others use REFRASIL for jet engine insulation.

Method: 5. American Airlines and others use REFRASIL for jet engine insulation.

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Method: 20. American Airlines and others use REFRASIL for jet engine insulation.

Method: 21. American Airlines and others use REFRASIL for jet engine insulation.

Method: 22. American Airlines and others use REFRASIL for jet engine insulation.

Method: 23. American Airlines and others use REFRASIL for jet engine insulation.

## Tiny Transistor

Midget amplifying device draws only 0.6 microwatts power.

A new type of transistor, the tiny amplifying device invented at the Bell Telephone Laboratories, has been shown to have "amplifying properties never before achieved in any amplifying device." And development of the signal transistor has proceeded to the point where it is ready for commercial application.

In making its announcement, Bell created Dr. William Shockley, who initiated and directed the transistor program, with predicting the new type two years ago as a result of theoretical studies he carried on as part of the Laboratories' basic transistor physics program.

Two Transistors—The signal type of transistor invented by Shockley is described by the term "point contact." In the test, two lead-rod wires rest on a small piece of germanium, a semiconductor material element. There is no glass envelope needed, no vacuum, and no electrical connection required. The tiny transistor is housed in a metal cylinder about the size of a .22 cal. shell.

The new gadget, termed a junction transistor, is even smaller.

The transistor has no point contacts, which in the original type corresponded to the terminals of a vacuum tube. Instead, the unit consists of a tiny rod-shaped piece of germanium, treated so that it comprises a thin, electrically positive layer sandwiched between two electrically negative areas.

The wire is derived from the junction between the negative ends and the positive layer. The entire rod is enclosed in a hard plastic bead about 1/4 in. dia., with wire leads connected to each of the three regions and extended out side. In this form, the transistor takes up about 1.4 cubic in. or, when tiny only, a subminiature vacuum tube occupies about 1/4 in. or less.

Transistor Details—Bell says that the most remarkable feature of these new transistors is their ability, in operation with negligible and power consumption. The best example quoted is that of an audio amplifier that requires for a power supply only 6 microwatts at 0.1 volt. This is only 1/6 microwatts of power which is a sharp contrast with the million to six microwatts required to heat the cathode of the ordinary receiving vacuum tube.

The power handling capacity and efficiency are high. The design can be varied to permit the frequency of power up to about two million. And further the static characteristics are such that they A efficiencies of 4% or 4% out of a possible 50 percent can be realized. For



class B and C operation, their efficiencies are correspondingly high, reaching as much as 75 percent.

The size is compact and rugged. The plastic bead enclosure gives a very sturdy unit with high shock load resistance.

Whisper tests at the audio frequency range produce no measurable mechanical noise.

Input and output impedances are at any point, whether the transistor is connected with grounded emitter, grounded base or grounded collector. Thus by choosing the appropriate connection, a considerable variety of input and output impedances can be obtained.

Collector capacitance limits the frequency response at full gain to a few kilocycles, but it is possible to use a suitable impedance network to sustain the frequency response to at least one megacycle while still obtaining a useful amount of gain.

At 1,000 cps, most of the units measured here show a noise figure between 10 and 20 db. Power gain of the order of 40 to 50 db per stage have been obtained.

Commercial Use—Bell says that their development work on the signal point-contact transistor has progressed to the point where this type will be put into field use as the Bell system early next year, in equipment manufactured by the Western Electric Co. for nationwide long-distance dialing systems.

Transistors of the point contact type are as reliable in performance as vacuum tubes, which, however, says Bell, is a very significant advance over vacuum tube two years ago. Thus, the transistor was highly variable in characteristics and not reliable.

But Bell's development work solved the problems of reliability and reproducibility, and it is now expected that regular production can be started. This action has been produced which can be checked and vibration better than any known vacuum tube. Further, transistors are expected to have service life longer than almost commercial vacuum tubes.

Bell says that the transistor can be designed for many specific functions, and that its performance range can be extended to include many applications which now require vacuum tubes.

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## Static Discharger

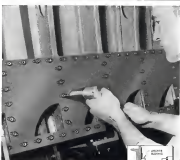
A new system for controlling precipitation static on aircraft has been patented recently by Prof. Henry J. Davis, director of the Engineering Experiment Station of the State College of Washington's Division of Industrial Research.

Precipitation static is a phenomenon associated with aircraft flight through rain, snow or sleet. As electrostatic charge accumulates on the surface of the craft, and builds up until some sharp edge causes a corona discharge. This discharge interferes with radio reception.

And as aircraft get larger and go

higher, the precipitation static problem becomes more acute. The charging rate on the plane's surface is directly proportional to the area bombarded by the ionized particles and to the rate of the ionized air speed.

Prof. Davis's system uses a discharger to bleed the charge from the plane just before operation of the discharger, the radio is blocked out momentarily. Then the radio is automatically turned back on again, while the electrostatic charge is so low that it causes no objectionable interference. Between listening periods, the interphones are so shut that they are rendered and the signal is heard somewhat continuously.



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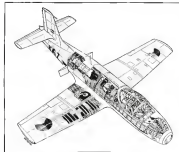
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## AERONAUTICAL ENGINEERING

### Fokker S.14 Jet Trainer Takes to the Air



Side-by-side seating featured in transition training craft.

By Irving Stone

A new member of the family of trainers built by the Royal Dutch Aircraft Factory (Fokker) has taken to the air.

This latest addition—the S-14—is the first designed from scratch jet trainer as distinguished from a modification of an existing jet fighter. And it contains the Fokker scheme of side-by-side seating to facilitate instruction.

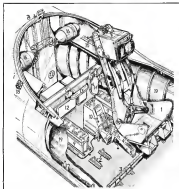
► **Trainer Series**—The S-14 is the third in Fokker's recent trainer string. First was the piston-engined S-11 (*Aviation Week* [June 6, 1946, p. 15], which was also built as a two-seat version, the S-12. Next came the S-13, a cross trainer powered by two piston plants (*Aviation Week* Oct. 1, 1950, p. 28). The S-14 followed and is powered by a single Rolls Royce Derwent IX.

The crux of the family, the S-11, already is the standard trainer for the Netherlands, Belgium and British Air Forces, and is being built under license in Italy by Macchi and I.M.M.

► **S-14 Scheme**—The S-14 was specifically developed as a transition jet trainer—to eliminate the need to modify fighter aircraft for dual instruction. While in accordance with the design requirements for airplanes for the Royal Air Force and the Royal Navy, it embodies the general characteristics of the "fast" jet fighters, but affords more envelope room, has its speed increased to a maximum of 440 mph at 33,000 ft., and its wing loading cut to a shade under 35 lb./sq. ft.

The lower wing loading will cut landing speed and maneuver control difficulties for the trainee.

Construction of the S-14 is straightforward, and emphasis has been placed



**S-14 Cockpit Details** 1, engine only; 2, engine test panel; 3, landing gear; 4, windshield heat control; 5, heat and ventilation control; 6, windshield de-ice pump lever; 7, oxygen regulator; 8, emergency flap control; 9, battery; 10, low oil warning and emergency fuel; 11, booster pump test switch and lamp; 12, radio; 13, oxygen transducer; 14, head for bottle; 15, wing tank; 16, oxygen bottle; 17, ground deceleration sensor; 18, canopy lock; 19, air intake duct.



in one accessibility and general use plane.

► **Cockpit Mileage**—Two seats from the nose air intake run along the fuselage side to the pleasure chamber in the engine compartment, which is made up of stainless steel bulkheads and stainless steel skin.

Cockpit accommodations two Martin Bucker question sets. There are full dual controls. Stick grips carry a firing button for rockets or bombs, gun trigger and brake lever.

Instrument panel is hinged to the rest by one accessibility and carries these units for the trainer: artificial horizon, directional gyro, rate-of- climb, turn-and-bank and winged indicators.

Machmeter, altimeter and attitude indicator. For the instructor, there is installed a machine altimeter. Machmeter combined with a speed indicator, gyro compass, vacuum gage, manometer, clock, and three indicators—turn-and-bank, engine speed, oil pressure, jet pipe temperature, wing flap position, fuel level, brake pressure, landing gear emergency control pressure and position, and hot air temperature.

Under the instrument panel is the switch panel for electrical and radio installation.

There is a centrally located control pedestal and the cockpit also houses the batteries, radio receiver and transmitter and engine battery.

The large canopy allows wide vision and is jettable.

► **Easy Access**—Fastings run section is integral with the vertical tail, is hinged to the center section for detachability and carries three fastage-type dive brakes.

Fastage upper and lower surfaces are fitted with numerous perspective panels for easy access to controls, electrical installations, de-ice tank, flap and brake systems, and powerplant.

► **Wing Details**—Wing without sections have 1 deg. dihedral, outer panels 7 deg. Wing has single main spar and two secondary spars.

Inboard panels each house a 105-gal



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## Fokker S.14 Jet Trainer



Span	39 ft 5 in
Length	41 ft 8 in
Height	12 ft 4 in
Weight empty	7,319 lb
Empty load	
Two occupants, chassis	480 lb
Fuel (144 gal.)	5,996 lb
Oil	24 lb
Com. weight	11,250 lb
Wing area	347 sq ft
Wing loading	32.8 lb/sq ft
Power loading	9.11 hp/sq ft
Max speed	21,000 ft—440 mph
Max cruise	20,000 ft—400 mph
Rate of climb, 11	3,100 fpm
Climb to 10,000 ft	3.5 min
Climb to 40,000 ft	15 min
Service ceiling	40,000 ft
Endurance	45,000 ft—1.5 hr
Wing 444 gal	3.24 g/hr
Wing 402 gal	2.5 g/hr
Engine	Rolls Royce Whittle J35 turbojet at combat rating of 14,750 rpm, 1,600 lb



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nylon fuel cell. Outboard pumps each accommodate two fuel cells—one of 72 gal., the other 30 gal. Total storage is 102 gal. Fuel is transferred from outer to inner tanks by air pressure. Six winged electrical booster pumps are used, and large panels provide access when quick change of fuel cells is necessary.

Underwing carries two dive recovery flaps.

► **Pressures Used**—A pneumatic system supplied by a compressor mounted on the engine accessory gearbox operates the landing gear, flaps, wheel brakes, dive brakes and dive recovery flaps, and regulates pressure for canopy locking. The pneumatic system panel is mounted on the bulkhead in the rear of the nose-wheel fairing.

Five extraneous systems comprise two engine-mounted spray rings and three bottles mounted on the engine compartment rear bulkhead. The system is electrically operated from a location on the control panel.

Twelve flame detectors, which actuate a warning light, are located in the engine compartment.

An inertia switch is installed, which shuts down the extraneous system in event of a forced landing.

## NACA Reports

► **Some Properties of High-Purity Six-sided Wrought Molybdenum Metal at Temperatures up to 2400° F.** (TN 2319) —By R. A. Long, R. C. Dike and R. R. Rags.

These tests showed that commercially pure sintered wrought (annealed) molybdenum possessed ductility and tensile strength comparable with or higher than other pure high-temperature materials in the temperature range between 1800° F. and 2400° F. At 1800° F., the short-time tensile strength varied between 25,519 and 33,870 psi. At 2400° F., the tensile strength varied between 13,070 and 16,440 psi.

Recrystallizing lowered the tensile strength at all temperatures. Metal so treated was quite ductile at high test pressures, extremely brittle at room temperatures.—DNA

► **A Survey of Stability Analysis Techniques for Airframelessly Controlled Aircraft** (TN 2275)—By Arthur L. Jones and Benjamin H. Briggs.

This survey is limited to the techniques commonly applied to linear, continuous-control systems wherein the difference between the output and input is measured continuously and is used in the operation of the system.

An evaluation of such techniques is included, based on the kind and

amount of desired information. And a simple aircraft-stability assessment is typical aircraft-stability assessment.

There is an extensive list of references and bibliographical material appended to the note.

—DNA

► **Transient Flow Past a Wedge Profile with Detached Flow Wave—General Analytical Method and Final Calculated Results** (TN 3399)—By Walter G. Vincenti and Chao B. Wang.

This is the first of three papers to be published by NACA under a common general title relating to the problem of calculating the transient flow past a

wedge with detached flow wave. This paper examines an outline (largely on mathematical) and direction of the final calculated results. The case is shown that they will present the second report dealing with the computational details. The final report will be written by Arthur E. Bryson of the California Institute of Technology, who has conducted, with Hsiao W. Lapanakis, an experimental study simulating the three actual case reported here.

In the calculations, the round flow over the front half of the profile is determined by a similarity solution of the small disturbance equation in the boundary layer. Over the rear half, the

small

simple

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pressure response flow is found by the method of characteristics. No special assumptions are involved.

- These results are found in function of the transverse velocity parameter:
- Mass wave and static flow shape and location.
  - Mach number and pressure distribution in a channel.
  - Flow wedge, wet wedge and complete profile integrated pressure drag.

—DAA

#### ► On Reflection of Shock Waves from Boundary Layers (TN 2534)—by H. W. Ingpen, A. Rodko, and S. Dhanoo

This report covers an experimental investigation carried out by the authors at the Canadian Aerodynamic Lab of the Canadian Institute of Technology. The investigation was sponsored by and received financial assistance from the NACA.

Mach number range covered is from about 1.5 to 1.8; the Reynolds number was 900,000.

The investigation confirmed the difference in shock-wave interaction with laminar and turbulent boundary layers, a phenomenon first found in laminar flow.

The relative upstream influence of a shock wave impinging on a given boundary layer has been measured for both laminar and turbulent layers. For the

laminar layer, the influence is found to be on the order of 50 boundary layer thicknesses as compared with about five for the turbulent layer.

Separation always occurs in the laminar layer and is restricted to a region of finite extent upstream of the shock. In the turbulent case no separation was found.

The difference between supersonic and subsonic shock waves is discussed and their interaction with the boundary layer is compared.

The authors present some general considerations on the experimental production of shock waves from wedges and cones, and a discussion of the boundary layer in supersonic flow. They also present a few examples of the reflection of shock waves from supersonic shear layers.

—DAA

#### ► Approximate Calculation of Turbulent Boundary-Layer Development in Compressible Flow (TR 2557)—by Morris Tucker

The calculations in this note are based on the selection of the adiabatic static wall temperature and the upstream temperature as a reference. This choice leads to a friction-drag Mach number relationship which is in substantial agreement with the correlated Prandtl-Volpert relationship and which

is also amenable to boundary layer calculations.

The report presents in tabular form numerical solutions of equations appearing in the Karman momentum equation for a range of Mach numbers from 0.100 to 3.0. The approximate calculation of boundary-layer growth can be reduced to routine arithmetic.

The author's concluding remarks add that accurate experimental verification of the predictions is required.

—DAA

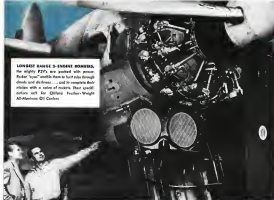
#### ► Reinforcing of a Delta Wing in a Supersonic Flow (TM 1287)—by E. A. Karpovich and F. L. Frankl

This is a translation of a note which appeared in a Russian scientific journal in 1947. It calculates the drag of a delta wing whose leading edges made the Mach cone. And the calculations are performed in such a way as to separate out the term of suction drag.

The analysis is limited to small angles of attack.

As a sidelight, the early success of the Russians in the delta winged genre is mentioned not only by this note. One of the references is to a paper in the left margin on delta wings, entitled to M. I. Gusev, undoubtedly and half of the former design team of Mikoyan and Gurevich.

—DAA



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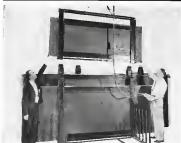
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## PRODUCTION



## Library Stocks Sheet Metal 'Books'

Sheet metal storage at Pratt & Whitney Aircraft has gone high-tech.

The engine builder is stocking the flat stock as "books" in a novel "library" arrangement that reduces a 90 percent reduction in material handling time and a 50 percent saving in floor area over the previous storage method.

► **Deflection**—Sheet metal storage for a high rate production program can be a troublesome problem. Flat-booking of hundreds of thousands of pounds of material takes up a lot of floor space. And P&W's jet engine production calls for a wide variety of sheet thicknesses, sizes and thicknesses.

There are 14 grades of alloy steel, 11 aluminum alloys and Nonalloy steel. These encompass gauges from .016 to .25 in. The gauge composition-size factors give a total of 353 different combinations.

The complexity of the sheet stocking arrangement gave P&W's Harve A. Leonard, East Hartford plant supervisor at ultra-plant material movement, some ideas for relief.

► **Book Plan**—He came up with a scheme for stocking the sheets vertically as units (pages) in a package (book) filed in a storage arrangement (bookcase) that accommodates 475 sheets each holding a maximum of 1,000 lb.

That's how the plan works: When a new crate of sheet metal comes into the plant it is placed on a steel transfer rack

by an overhead crane. The crate top is removed, and one of the steel-reinforced heavy plywood book covers is substituted, hooked to a steel channel that serves as the book hinge (hanging).

The rack covers large open overhead space and then turned over with the aid of the crane, and the rack removed. Next, self centers the balance of the shipping crate and the second cover attached to the hinge. Then comes transfer to a solid steel vertical storage rack until the material is needed.

► **Easy Handling**—For easy extraction of test samples, the book is crane hoisted from the storage facility and placed in a V-rack with sides at an angle of 70 deg. This permits the cover to be opened sufficiently for easy removal of a sheet that is needed.

When a batch of the sheet is required at a shop or plant, the complete book is transported and any remaining material is returned to storage between the covers.

In addition to the benefits of more space and space savings, this proven handled vertical storage method also means that surface scratches usually incurred when stock, stored flat, is stacked and stacked in returning the required units.

James Tank & Widdell division, United Tool & Die Co., Inc., Hartford, Conn., has been authorized by P&W's Leonard to manufacture the system.

Proper  
Aircraft  
Maintenance,  
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## Martin Subcontracts Rising Sharply

Subcontracting, supplies and vendors, particularly those on the eastern seaboard, are expected to reap an estimated \$85 million harvest this year from the rapidly expanding outside purchases program underway at the Glenn L. Martin Co., Baltimore, Md.

A contractually swelling backlog, now at approximately \$400 million, explains the early increased outside expenditures, which is 312 percent over last year.

Subcontracting alone will account for more than two-thirds 1970's purchases, some \$73 million being estimated for this purpose, with nearly 60 of the smallest companies and equipment scheduled for delivery next year.

Typical users of Martin's purchasing resources show that the Atlantic seaboard states are heavily favored, usually because of their proximity—a key factor in outside buying. Maryland itself has about 150 sources, with particularly big totals in or near Baltimore, New Jersey and New York each have 600, Pennsylvania has 400, Ohio, 600, and California, 400. The total figure, covering smaller numbers in other states, comes to 3,867. Two-thirds of Martin's business will go to firms employing less than 250 workers.

How these small business concerns grow as a result of the company's programs is exemplified by one Delaware firm which so far has received \$700,000 in expenditures and is getting an additional \$600,000 worth of business. This organization as a result has expanded its roster of personnel from 150 workers to 425.

Glenn L. Martin at present is working on substantial USAF contracts for a night intruder version of the British Canberra jet bomber, the P3M-1 Martin flying boat for the Navy, approximately 140 F-4 fighters, and classified missile projects.

## Start 'Cafeteria Style' USAF Tool Selection

An Air Force contractor now can go to the Menards, Co., and Omaha, Neb., hardware tool stores, who to select personally the tools they need to fulfill defense contracts.

The new "cafeteria-style" plan has been instituted by Air Material Command, to speed delivery of critically needed tooling and save more money in selection. Up to now, many contractors ordered their requirements from the pool from stock control ends with few opportunities for on-the-spot choosing.

Here's how to get the tools you need: • To begin with, the trade you are a bona

fide USAF contractor now. You must have a facilities contract. You must have an actual need or requirement for the tools you seek for.

• The contractor has to be scheduled to cut the storage rates. This can be readily done by contacting the Industrial Equipment Section, Production Resources Division, Air Material Command, U.S. Building, Fourth and Main Streets, Dayton, Ohio. Attention: MCPRSE.

• After selection of tools, shipping arrangements will be made from the Industrial Equipment Section of Headquarters, Air Material Command, provided the contractor's requirements are in line with his production needs. After approval, the tools will be shipped out of the storage center in bulk as most cases can get them about transit, trucks or the contractor's own conveyances. Industrial Equipment Section has been headquarters of several billion of dollars worth of high production and close tools at the two sites since the end of World War II. The machinery has been carefully preserved in an "as if" condition.

## Welds Tip Tanks

An automatic welding process is cutting the cost for wingtip tank fabrication at Republic Aviation Corp.

The method is a changeover from a hand welding procedure on the 210 gal unit which was altered to incorporate a heavier flange for a tighter seal. Difficulties were encountered because of the small tank radius, long length, lack of temperature control, warp, and weld porosity.

Company engineers designed a welding tool specially for the tip tank job. Eventually, it is a changeover method now can be in a chain pull and cover 30 in./min. No oil is used—the tank flange edges being lined for the desired lead. Wargup is well before maintenance. Operator training time also is less.

## Bendix Subcontracts Over \$33 Million

Small business firms (500 employees or less) have secured over \$1 million monthly in subcontracts over this past six months from Bendix Radio division of Bendix Aviation Corp., with these alone accounting for more than one-third of the over \$33 million worth of rapidly expanding electronics work subcontracted during the period by Bendix Radio.

Among its plans for further expansion, Bendix Radio's subcontracting section has already awarded complete subcontracts for as much as \$300,000 in addition to its present subcontracting

The present program entails the services of 72 major subcontractors who make complete units designed by Bendix Radio type readers, 150 firms making special arrangements to develop drawings and specifications, and about 400 who supply generally standard parts such as relays, capacitors, coils and jacks. Bendix Radio division is located in Bloomington, Md. Its subcontracting section is headed up by Robert E. Wines, who works in cooperation with director of purchases John L. Winchester.

## Boeing Plane Spares About \$190 Million

Boeing's airplane spare parts contracts with aircraft firms have climbed to a new \$190 million for the Seattle and Wichita plants. Military spare shipments this year are expected to reach \$50 million, in great 551 million in 1970.

Costly scheduled use of USAF planes because of the Korean conflict has been the key factor in spare parts business booming. Commercial plane spares to be shipped by the company this year will total some \$1.5 million. It's sure to see how big the order is, when these are some 70,000 to 75,000.

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Deflatable Type For Air Ram  
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pressure  
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Complies with A.P. commercial specifica-  
tion 41000 B.  
For road and air, warning applications and  
in safety controls for engine deicing systems.



### PRESSURE SWITCHES SERIES MB50

Gage, Deflatable Type  
Actuating Pressure Range: 2.5 psi to  
300 psi  
Medium: MIL, Puro, hydraulic  
fluid, oil  
Electrical Rating: 35 VDC 5 Amp  
Inductive to 0.0001 sec  
Complies with A.P. commercial  
specification 41000 B.  
Over 50 different types designed  
and produced



### HIGH PRESSURE SWITCHES T100

Actuating Pressure Range: 200 psi to 5000 psi  
Medium: MIL, Puro, oil, hydraulic fluid  
Electrical Rating: 35 VDC 5 Amp to  
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parts, including engines, on one airplane  
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active spare parts items. Even on ac-  
tive flying planes, the company is sup-  
plying some 15,000 different types.  
On the supply list are the famed  
World War II B-17 Flying Fortress, the  
more recent B-29 Superfortress, and the  
B-47 Stratojet, Stratojet, and the  
receiving B-47 Stratojet.

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clude the upcoming workload N3-12  
now being built at Seattle.

### OUR EXPANDING INDUSTRY

Boon Aircraft Corp., San Diego, has  
received 50 million in new orders for  
jet engine components, boosting its  
bookings to over \$40 million.

Boeing Airplane Co., Seattle, is mov-  
ing its experimental department to  
Renton. The move, involving about  
2,500 employees, will boost Renton pro-  
pably to nearly 5,000. A new \$250,000  
airframe modification has been placed  
in operation at Renton to accommodate  
the new load of experimental work.

Bellanca Aircraft Corp., New Canby,  
Del., has been granted contracts by  
Clem L. Martin to build P-1M-1 Ma-  
lin flying boat five, radars and radar  
film, with first completed component  
scheduled for delivery late this year.

LaPorte Plasmolite Corp., Wind-  
sor Locks, Conn., has entered the ac-  
tion field with purchase of the South  
Western Co. E. Hartford, which has  
been engaged in making parts for  
United Aircraft division. The South  
Western will be operated as the  
Aircraft division of LaPorte.

Jack & Hents, Cincinnati, Ohio, re-  
ceived Air Force Navy facilities con-  
tract making a \$1.5-million expansion  
in tools and equipment. More than  
two-thirds of the tools will come from  
the services, about one-third at the  
added facilities will be located in the  
plants at two major J&H fabri-  
cators, Universal Wire Spring Co.,  
Cincinnati, and Riverside division of  
Overland Motor & Mfg. Co., Mil-  
waukee. In addition, J&H is undertak-  
ing an extensive subcontracting pro-  
gram, involving about \$500,000 with  
Apex Electrical Co., Cincinnati, and  
Whitpool Corp., St. Joseph, Mo.

■ Aircraft Accessories, Inc., Baltimore,  
has been awarded two contracts by the  
1111 Electronics Group, Griffis AFB,  
Rome, N. Y., for development and  
manufacture of airborne beacon and  
other radio equipment. Booking of the  
company is now about \$1 million.

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ing and maintenance costs compared  
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has 80% efficiency — 100 mph for 10  
hours. Takeoff taking 200 psi, at 2,000  
rpm. More than twice that full prop  
performance, rate of climb at 1,200 rpm.

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compressor protection. For added control,  
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## EQUIPMENT

### CB System Slated in Convair 340

Advantages claimed for engine fire fighting include lower weight, greater effectiveness than CO<sub>2</sub>.

By Scott H. Rempage

First engine aircraft equipped with a fire fighting system employing CB fluid will be the Convair 340. Consolidated Vultee Aircraft Corp.-Toll Aviation Wings has specified the use of CB for protection of the 340's engines. Both United Air Lines, with an order for 48 of these planes, and Braniff Airways, which has ordered 20, have approved use of CB, Convair reports.

Deliveries of the 340, now in the final testing stage, are scheduled to start next March. Including smaller orders from such airlines as Delta (10), Mail Central (50), Hawaiian (50), Continental (7), Northeast (5), the Transair airline, Aero G/T (3), and miscellaneous orders from oil companies and other firms, Consolidated is due to have orders for 182 of these craft.

Presently, all or most will be equipped with CB engine fire extinguishing systems, following the lead of the larger jetliners.

► **AF Preference**—CB extinguishing agent, or bromochloroethane (BCB-CB), replaces CO<sub>2</sub> extinguishing fluid, which already has proved out in favor of CB in the recent plane engine, CO<sub>2</sub> unit is standard for engine craft to the CB system in the 340 still has to handle Civil Aeronautics Administration approval. CB is a German development, modified after considerable research, primarily by the Air Force.

CB is a weight saver. Found for proof, it is a great deal more effective in getting out fire than CO<sub>2</sub> extinguishers. This permits Convair to install an engine fire extinguishing system which is about 50 percent lighter in weight than a CO<sub>2</sub> system of equal effectiveness. The weight saving should be about 50 lb., according to Walter Kilde & Co., Inc., which will supply the equipment to carry CB in the 340.

► **Advantages**—Generally, here is what engineers close to CB development list as advantages of the product.

► **CB provides additional safety** over CO<sub>2</sub> at low weight. The engineers claim equal effectiveness with a weight reduction of 15-20%.

► **More effective delivery** at low temperatures than CO<sub>2</sub>.

► **Requires only 400 psi pressurization** compared to 550 psi in CO<sub>2</sub> systems.

► **Reduces the size of fittings and tubing** in the system considerably, according to Kilde.

► **Comparable to methyl bromide** in extinguishing ability and can be used in methyl bromide equipment now employed by the Navy.

► **Consistently less toxic** in the natural, unburned state than methyl bromide—slightly more toxic than carbon tetrachloride.

► **Disadvantages**—Some concerns against CB could be that it has never shown itself superior to methyl bromide as an extinguishing agent, according to some engineers, while methyl bromide in some instances has shown itself superior to CB. Also, methyl bromide is produced in greater quantities and costs less.

The CAA regards both methyl bromide and CB as more effective in putting out engine fires than CO<sub>2</sub>.

During development of experiments in the Civil Aeronautics Administration tests of the CB fluid now being conducted at Indianapolis, a CAA engineer close to the project indicated that the agency would approve the use of the CB extinguishing system in the Convair 340.

► **340 System**—The new system planned for the 340 will have two steel bottles located in the left wing filler, each carrying 32.5 lb. of CB agent. Two one-third inch diameter lines will provide two shut-off protection for either engine. The containers will be charged by adapters to a pressure of 400 psi.

Two lines, each with a double check valve are provided to the lines to the engine to prevent flow of CB from its own tank into the mixing tank. The line carrying the fluid is only 1 in., compared to 1½ in. line used in CO<sub>2</sub> systems.

Stainless steel line probably will be used in the engine section, but the steel used to be used against this area is still under discussion. The Air Force uses aluminum alloy tubing in areas other than the engine section. CB will not be used in the 340 for extinguishing fires in the fuselage, Convair points out.

An interesting possibility of CB, according to Kilde engineers, is that an aircraft could be fitted with an independent CB system, consisting of a supply tank in each section limited by manifold to reserve protection, at low weight than present installed CO<sub>2</sub> systems.

While the Convair 340 may be the first production plane equipped with CB intended for airline use, it will not be the first civil plane thus equipped. East Shipping Co. already is installing some of its private air fleet to CB. For added safety, East's planes will be equipped with systems carrying 500 percent more CB than the minimum is required for airline transport, according to Col. R. W. Egan, manager of the firm's aviation division.



Kaiser Air Lines' house-made tire puller removes old large and medium-size tubes at its own overhaul base in Miami.

#### YANKS TIRE

Use, costly removable tire puller developed by Davis Tellys, Inc. (Aviation Week, May 3)



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AN1540-1 AN1540-2 AN1541-1

**AN1540-1** Iron-Constantan Spot-checking-spool type thermocouple for measuring cylinder-head temperatures. Also available in copper-constantan and in 14 MDC wire for other material.

**AN1540-2** Iron-Constantan Spot-checking-spool type with copper lead for 14 MDC plug. Wire guard and supporting bracket are stainless steel and connections are protected with flexible neoprene covering. AN1540-2 terminals are silver-soldered to leads.

**AN1541-1** Iron-Constantan Spot-check Type thermocouple with junction located at silver tip. Spring guard with this thermocouple will retain its strength despite high temperatures.

**AN1541-1** Chromel-Alumel Tail-pipe Thermocouple. Installed with a temperature control system and overhauled with stainless steel wire, this thermocouple is built to withstand severe jet engine service life cycle exposure to peak temperature variations.

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. . . To a Remodeled C-54E

It's not dropping from 404 engine into a bucket. A nearby electrical line shorted. Forty-foot flames melted off the engine, consumed the muffler and wing and saved the landing. Cals Lewis Engine's DC-1 was so badly scorched by the Tokyo Airlift that the company decided to scrap it. Two and a half months and 35,000 man hours

later, the ship was flying again. It had also been converted from an "A" to an "E" model aircraft, giving it greater fuel capacity and range. Robert E. Calkins, vice president and director of Cals, believes the conversion is "the largest structural repair ever undertaken by an independent company or factory on this type of large aircraft."

## Greater Safety Around Planes

A new line of spark-protected gasoline fuel tanks, designed to operate with maximum safety in gas and dust laden areas in hangars and around aircraft are now available from the Yale & Towne Mfg. Co., Philadelphia, Pa.

Safety features of the equipment:

- Fuel System—Heavy welded steel fuel tank and automatic leaking fuel filler cap. Arrangement is such that overflow cannot drip on electrical system or hot engine parts.
- Copper fuel lines are well supported against vibration and located so leaks will avoid hot parts. Fuel filler bowl is oil-sealed.
- 1 mil-thick metal air horn connects motorized directly to a back fire arrester type air valves.

- Water jacket on exhaust manifold keeps exhaust system and engine temperatures low. Water sprays in the muffler quenches sparks.
- Electrical System—Low tension wiring enclosed in tubing, runs to metal terminals, it will supported and located well away from moving parts and other portions of the engine which might cause damage.
- High tension wiring if enclosed in grounded flexible metal conduit. Spark plugs are shielded as are the generator, starter, high tension coil, voltage regulator and distributor. Terminals are covered to prevent sparking from tools.
- The battery compartment panel starter buttons and horns are all shielded, enclosed and protected from sparks.

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## NEW AVIATION PRODUCTS



### Weather, Lab Aid

A compact wind velocity recorder for weather stations and research work which provides both continuous indication and a strip chart record of velocities between zero and 200 mph. has been introduced by Hastings Instrument Co., Inc.

All features of this equipment, with the exception of the pickup head, are packed into a single, rugged unit. It is a dual range instrument. Range One, from zero to 50 mph, Range Two, from 50 to 200 mph. Velocity indications are made by a pen moving over a logarithmic scale.

Range 1 uses sheet right in, of two of the chart and is wide open and easily read up through five mph, according to Hastings. Range Two uses sheet zero in, at travel. For maximum accuracy and reliability, velocities between five and 50 mph are read on the expanded scale of Range Two. Switching from one range to another can be accomplished manually or automatically.

Either a differential or ballistically sensitive type (thermoelastic type) can be supplied. The set operates on 110v a-c, 60 cycle current and voltage regulation is provided. Address: Super Highway and Pine Ave., Hampton, Va.

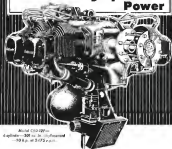
### Fitting Saves Time

A new instrument is a quickcheck test fitting designed to speed installation and servicing of aircraft accessories operating with flexible tubing.

Developed by Lear, Inc., the fitting already has been put into use by that company with its Model 150 Series power seats and Model 568A seatbelts. According to Lear, actual field tests have shown a savings of seven days in time in the installation of an eight-strapped system with the new fitting.

An important application of these seatbelts is in Lear's wing strut retraction system for use with jet engines. The consistency of a power seat, eight seatbelts and flexible tubing is no

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quard. The apertures normally is installed in the periphery of the engine air inlet section so connection can be made to the inlet section. The entire assembly weighs less than 15 lb. (based on its assembly now in production for one construction); and Last. Address: 110 Iowa Ave. N. W., Grand Rapids 2, Mich.

## Aerial Tanker Motor

Special provisions against fire and explosion during in-flight refueling are taken in a new fast booster pump motor reportedly in use on Boeing subsonic bombers.

The 5 1/2-hp motor incorporates specially designed flame arresters at the air inlet and an outlet containing ducts of the unit. If an explosion occurs within the motor chamber, the resulting flame is impeded by the completely confined in that area by the arresters, while the engine's flame—main flame—is disrupted immediately through the arresters and ducts. The equipment designated Model DM-1, is being produced by Jack & Monte, Inc.

The unit is protected against over heating caused by operating above specified loads or by a locked rotor. A thermal protector, activated by both ambient temperature and current, oper-



ates a motor contractor producing the motor fan fan with the rotor locked and driving 1750 rpm at output loads exceeding alternate trip rating.

The unit has an automatic conductor welded to the construction, also has and special housing that allows the pump to be coupled with the motor. It is self-cooled for continuous duty up to 15,000 ft altitude. Address: 17600 Broadview, Cleveland.

## Tougher Compound

Reformulation of synthetic rubber O-ring Compound 41 by the Parker Appliance Co. has raised the high temperature resistance of this material almost 100 percent, the firm reports.

The improved formulation will withstand temperatures from -65 to 400°F. It formerly was rated at -65 to 165°F. Increases of the high temperature resistance of Compound 41 has not affected flexibility at -65°F, says Parker.

Development was carried out in response to specific requirements of the Wright Field Power Plant Laboratory and aircraft engine manufacturers, it reports. The material is resistant to aircraft engine oil AN-VVO-416 grade 1120, AN-4 S, SAE 40, 50, 60 oil, and water fluids. Other properties include Shore A hardness of 65 deg., elongation of 175 percent and tensile strength of 2115 psi. Address: 17125 Euclid Ave., Cleveland 12.

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Temperature range of "Lampy" lamp oil has been extended to boiling point of 2900°F. Can be obtained in 12 or 15-day steps from 315°F to 460°F, and in 15-day steps from 460°F to 2900°F. Available from Tensol Corp., 132 W. 22 St., New York 11.

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assembly

Basically, a blind mechanism rivet, the Blind Bolt saves you time and expense in production or maintenance. A three-piece assembly, the Blind Bolt consists of a hollow rivet, an insert screw and the expanding nut.



To install the Blind Bolt on Inexpensive a Cherry adapter is engaged in an automatic screw driver. This adapter fits into the grooves in the screw head of each Blind Bolt. Operation of the screw driver causes the screw to turn against the blind side of the job. When the screw is driven rapidly against the screw driver, the screw drives automatically in the job to acquire, leaving the Blind Bolt assembly installed.

NOTE...Look to Cherry Rivet Company's complete line of blind rivets and high strength structural bolts.

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## AIR TRANSPORT



CIA PROTOTYPIST SURVEY GROUP is pictured with two British jets, at the de Havilland Aircraft plant here, among two of British aircraft plants. Left to right:

Frank Lloyd, de Havilland, Otto Radtke, American Airlines; Ron Gordon Boeing Aerospace Co.; Don Robinson, British Ministry of Civil Aviation; Capt. Wilton Moss of

Four American World Airways; Air Line #4 "Air" Air; Ron Smith, General Electric Corp.; Harold Haskins, CAA, chairman, and Col. Ted Eric, Defense Dept.

## We Can Catch British Jets, Group Says

But time is running out if we are to overcome English headstart in transports, returned specialists warn.

By Alexander McInerney

It is high time to start cutting metal on some U. S. advanced jet transport prototype plans before the British stretch their lead in this field so far it cannot be overcome.

That is the warning of an American government and industry aircraft and airline specialists who have just returned from a look at new European transport developments.

The American prototype survey group says that the British aircraft industry now has a 3-to-1 year advantage, over the U. S. in competitive jet planes already built and now in flight test program.

► **British Lead—**"During 1912," the survey group has reported to CAA, "the type aircraft industry was in the air. The impact of the British lead will start to be felt by U. S. international airline operators."

Three months jet transport spectrum with British equipment was by a margin of three years later, some members of the group predict.

The survey group also reported that there appears to be no further need for aircraft, available in the near future, which will be able to provide warning services between New York and London or New York and Paris, and some members that stage of the jet prototype

proposed by the industry committee to increase, approach to meet this requirement.

The survey group included representatives of U. S. aircraft and engine and airline companies an airline company with long international flight experience, and two government officials. These are the men: Ron Gordon, Boeing; Ray Smith, General Electric; Otto Radtke, American Airlines; Capt. Wilton Moss, Pan American jet representative; and Col. Ted Eric, Defense Department, deputy chairman.

► **The Countdown—**Three major transport replaces currently in production in quantity in Britain are now in the air and airline companies an airline company with long international flight experience, and two government officials. These are the men: Ron Gordon, Boeing; Ray Smith, General Electric; Otto Radtke, American Airlines; Capt. Wilton Moss, Pan American jet representative; and Col. Ted Eric, Defense Department, deputy chairman.

► **Victory Viscount 700,** a turboprop (H-Pac), model, distance, four-engine plane, powered with four advanced half-Rocket Drive (each rated at 4,400 shaft hp plus 295 to 310 jet thrust).

► **De Havilland Comet,** highly polished 4-gal. 51-passenger, equipped with four short of four 10,000-hp engines in present configuration, but with Rolls Royce Avon in a 3-Mk II airplane, even be able to take on the world's first turbofan transport route, London-N.Y.

► **British 177 turboprop transport,** a 12 place four-engine plane, described in some of the American aircraft in capacity of carrying the same load over the same distance as the American Boeing jet-engine Stratocruiser at a speed approximately 100 knots faster (Photo type of this plane had not yet flown at the time of the visit to British jet prototype and production versions are being built simultaneously and some estimates are the plane may get into service by 1955).

► **British new British plane,** the 18-18 place Harrier, four-engine, with four four-engine 100-hp engines, and apparently one use in a report from the survey group to the full cost matter that European leader plane needs to be a smaller and "more cost" type of airplane than that covered in our specifications.

► **U. S. Entry—**Compared to these British types, the U. S. was just one turboprop cargo prototype, being the Convair Turboquest, powered with two Allison turboprops—while the only U. S. jet powered transport to be built was the modified four-engine C-121 military aircraft transport. At least two companies, Boeing and Lockheed are known to have shied of producing transport jet transport designs due to their inability or unwillingness to take on the high development costs for flying prototypes. Costs for such a development have been estimated at from \$20 to \$10 million.

The following survey group reported



that the British government had spent approximately \$100 million since 1945 in its postwar civil transport development program, including prototypes of other aircraft than those mentioned above, such as the giant Bristol Britannia, which apparently is not going into quantity production.

The survey group's report was not entirely pessimistic in regards the U. S. future in transport production.

"Our government is potentially second in rate in technical development as compared," the survey group reported.

"The U. S. may not have lost its irreplaceable amount in competitive position in turbine-powered transports by delaying until this time of immediate steps to take."

► **For Immediate Action**—This is the immediate action recommended:

- Intensive testing of available turbine-powered aircraft in order to obtain design, operating, safety and expert data.
- Start development of advanced types.

The first recommendation personally calls for a reexamination of the advanced commercial plan to run two North American Boeing B-45 bombers on a scheduled airline route operated by airline pilots to give operational experience in the cockpit, turbine maintenance, and other factors. Finally for this open item have not been made available by



ADAMS TO PANAM

Robert B. Adams has been named vice president of Pan American World Airways effective Aug. 1 to represent the airline in Washington and as international route work. Adams has been assistant to secretary of state for airline relations and previously had served as a member of CAB.

Consent. It also presumably would entail flight test work with twin-jet planes in the Convair 440s and the first-stage Douglas C-124B which will be a civilian transport powered with four

Pratt and Whitney T-34 turboprops.

As to the second recommendation, the survey group, including government members, wants to get started and it doesn't care much whether it is private enterprise or government which supplies the money, the important thing being, it is getting without further delay.

► **Present Chance Slight**—Realistic analysis indicates, however, that there is little chance for a new government U. S. transport prototype program at the time.

First two U. S. operators to be affected by the British jet competition will be jet international airline operators, Pan American and TWA. Domestic U. S. airlines, which represent a far larger market for new airplanes, probably will not feel the pressure of foreign jet plane competition, except to a minor way, for some time to come.

There is talk of British Overseas Airways operating Conquers on the New York to Bermuda route, and there may be some Canadian jet operators. But the money making transatlantic routes can be expected to continue to give these present piston engine plane service for some time—perhaps until the attraction of becoming the first jet plane operator makes out of the domestic companies to shift to jet equipment. One

can doubt, the others, competitively, will probably have little alternative but to follow.

There is a serious question whether the highly competitive TWA and Pan American international airplanes would cooperate sufficiently to agree on a common U. S. jet transport to be financed by these jointly. This, however, government sponsorship in the most likely practical means of putting the U. S. back in the advanced transport development race.

► **European Factor**—Of French plans seen, the American survey group took most interest in the Breguet 701 double-decked four-engine cargo plane which was considered to have good prospects as an aerial freighter.

Condon told Aviation Week that he had made a special study of government sponsorship of plane development in each of the countries visited—Belgium, Switzerland and Sweden, Sweden France and England. In all except Switzerland he found some form of government subsidization of airplane development well established and in operation. In Holland the development was military, but the principles were the same. He felt Switzerland, the exception, had no large aircraft production.

Condon saw a direct relationship between Britain's big government expendi-

ture and their world leadership in jet transport development.

Spicing his forecast for his country, Condon said that he and Boeing felt that some U. S. airline government sponsorship of new transport prototypes was the only way in which the present stalemate in jet development in this country would be broken.

► **Individual Observations**—Capt. Moss, after returning to this country, made a weekend trip to Canada to fly the Avco Jetliner for comparison with the British types. He took the controls of the Viscount during a flight, but the survey group did not get a Comet flight. Moss said the British planes at a distance of voice over current U. S. types, and advanced passenger planes by the U. S. to get back into jet competition. He focused need for considerable study of holding problems with jets. Kisseloff pointed out that the foreign airlines using U. S. equipment had to carry large loads of spare parts. He thought that this, together with the favorable situation of British pounds vs. U. S. dollars, might be additional factors influencing the change of other foreign airlines to British equipment, when it became available. Moss said that the foreign airlines offer them British new delivery dates far any of the new British planes is somewhat distant, and that

why they had not made more definite commitments yet, since the British will get the lead of their new planes for their own markets.

Kisseloff was most interested in new engine test stands which he saw at the SAS shop in Stockholm and at Swearingen in Zurich.

A future presentation problem seen by the American Airlines engineer is in the rate of presentation. If it is expected that the more rapid ascent of jet transports will require a more rapid presentation to keep up with the rate of ascent, but this can only be made up to a certain point because of engine limitations. The British are already advertising pressurizing cabins to the equivalent of 10,000 ft altitude rather than 8,000 ft, so it is more consistently used.

The jet engine specialist, Ray Smith of General Electric reported that, once all, he considered Gen. Motors and the U. S. on a comparable basis as far as jet engine development is concerned, with the U. S. having an edge in production matters.

Smith looked at two de Havilland Ghost engines pulled for comparison by BOAC from a Comet after 2 1/2 hr. operation. He considered them in good condition and apparently capable of another 250 hr. without any important parts replacement. He considers that the

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increase was up 46.5% the first six  
months of 1951 over the same period  
last year. Air freight revenues during  
May climbed to \$1,415,000 covering  
domestic, Alaska-Hawaii and Ocean op-  
erations.

• **Oakland Municipal Airport**—Passen-  
ger traffic in and out of the airport was  
up 51% for the last six months of this  
year over the last half of 1950, with  
total being 932,955 passengers for the  
current period. Air freight through  
Oakland Municipal was up 430% to  
\$4,612,189 by over 1950 first half. Air  
cargo climbed 220% in the current half  
of this year over the similar period last  
year to 567,724 lbs.

• **Pan American World Airways**—Alas-  
ka region was heaviest for airline during  
first six months of operation. The line  
carried 6,580 passengers, a 35.5% in-  
crease over a year ago. Cargo was up  
42% to 720,237 lb., and extra sections  
number 37, July is expected to top  
line, with 18 extra sections already in-  
cluded. There were 73,930 passen-  
gers flown in first six months of this  
year.

• **Panagra**—A 27% increase in revenue  
passenger miles reported by the com-  
pany for the last six months of 1951,  
with the carrier flying 61,625,000 re-  
venue passenger miles during the period.

• **Pioneer Air Lines**—Cargo trans-  
ported 75,919 passengers during the  
last half of 1951, a 29.4% increase over  
the same period last year. Passenger  
mileage was up 24.5% to 15,797,644,  
and revenue of last six months 16% to  
\$42,547.75. Air freight and air cargo  
increased 17 and 11% respectively.

• **Railway Express Agency**—Air Express  
division reports that shipments, flown  
in and out of New York City rose 3.2%  
between July 1-7, compared to the  
same period in 1950, with gross re-  
venue rising 42.7% for the same  
period. Current period shipments rose  
15,027 and gross revenue was \$85,  
845.19. Deferred shipments were  
4,041 and released 4,968.

• **Slick Airways**—Scheduled flight com-  
line has expanded complete terminal fa-  
cilities at (Edwards International Airport,  
N. Y., under direction of Whitman  
Rowles, formerly of Philippine Air  
Lines. Slick will continue to base at  
Newark Airport, but its planes will go  
into (Edwards) as required.

• **West Coast Airlines**—First half of  
1951 showed sharp increase in revenue  
passenger and miles flown by the com-  
pany, with former up 79% and latter  
climbing 26%. Total for the period was  
34,230 passengers.

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Aug. 6-International air race for the Daily  
Express Cup, England.  
Aug. 13-15—Eight annual Michigan aviation  
week, sponsored by the Aero Club of  
Michigan.

Aug. 15-16—Fiftieth annual all women team  
contests at one, sponsored by the  
Northwest, Santa Ana, Calif., in (San  
Jose, Calif.).

Aug. 15-16—National Air Race, Detroit, De-  
troit-Wayne Motor Airport.

Aug. 21-24—Western convention of Na-  
tional of Radio Engineers and Seventh  
Annual Pacific electronic exhibit.

Aug. 22-26—International convention of the  
Navy Press, Mackinac Island, Michigan.

Aug. 25-26-1951 Pacific general meeting of  
the American Institute of Aeronautical Sci-  
ences, Indianapolis, Indianapolis Hotel,  
Portland, Ore.

Aug. 24-26-1951 annual convention of the  
Air Force Association, Anaheim Hotel, Los  
Angeles, Calif.

Sept. 3-7—Royal Aeronautical Society IAS  
Third international symposium on  
New Physics, Science, England.

Sept. 10-14—Sixth national instrument ex-  
hibition and exhibit sponsored by the In-  
strument Society of America, San Fran-  
cisco Conference, Monterey, Cal.

Sept. 16-16—Sixteenth annual general meet-  
ing of the International Air Transport  
Association, Westminster Hotel, London, Eng-  
land. Program includes air-day visit to  
BRAC Farnborough show.

Sept. 17-18—Twelfth Biennial display and ex-  
hibition of the Society of British Aeronautical  
Engineers, Farnborough, England.

Oct. 2-4—Biennial annual aircraft week, plug  
and system conference sponsored by the  
Champion Spark Plug Co., at Wichita, Kan.

Oct. 5-10—Special conference on aero-  
nautical applications, sponsored by the  
Air transportation committee of the  
American Institute of Aeronautical Engineers  
and the Los Angeles section of the In-  
stitute, Hollywood Roosevelt Hotel, Holly-  
wood, Calif.

Oct. 10-17—Fourth annual New York State  
conference on airport development and  
operation, sponsored by the N. Y. State  
Dept. of Commerce, N. Y. Aviation  
Building, New York City.

Oct. 10-11—Annual meeting of the State,  
California of Mayors, County Clerks,  
Assessors and the N. Y. State Planning  
Commission, San Francisco, N. Y.

Oct. 10-11—Annual meeting of the Transport As-  
sociation of Canada annual general meeting,  
Sopark Club, Montreal, Quebec.

Oct. 11 Nov. 1—University of California Ex-  
position, field and electronics meeting,  
Duke Hotel, Chicago.

Nov. 25-26—Ninth annual meeting of the  
American Distributors & Manufacturers  
Assoc., Waldorf Astoria Hotel, New York  
City, N. Y.

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**ALPA COULD CALL IN MRA**—After reading about the plots and counterplots within Air Line Pilots Assn., one wonders if it isn't time to call in Mutual Representation. We agree with Capt. Roberts who comments on ALPA in this issue. Roberts gives ALPA Founder & President David Beltschky credit for accomplishments. However, times have changed, and Mr. Beltschky hasn't. We wish ALPA and Mr. Beltschky the best. But their path, we think, should come to an end.

**COLLISION STUDY**—There are signs that responsible officials in government are becoming interested in taking action to prevent radar collisions. More near misses would be reported if pilots weren't afraid to talk about them. Pilots are afraid their employers or the government will turn around and take action against them for some mild indiscretion. If pilots are to be encouraged to report violations of orders, or to indicate the most critical phases of the job to be tackled first, some progress will be made toward planning a language program.

**YOU AIN'T SEEN NOTHING YET**—Work after work the helicopter hangs up new records of all kinds on the battlefield and at home. We have always concluded that the helicopter is the most versatile vehicle the world has ever seen. As remarkable as its feats have been, so date, they are only a hint of what you will see in the next 10 years. Don't underest the cockpit.

**THE BRITISH TRANSPORTS LEAD**—No matter how slow you slice it, the British are well ahead of us in developing jet transports. Everywhere we go, two aviation people ask us (1) if it's true, and (2) if so, what? The reasons are not as important as is the unpleasant fact that we trail England. Aviation Week has interviewed such members of the U.S. committee that just returned from an inspection tour of British jets. The story is in this issue and we hope it helps this country get off the chase.

**RUSSIA, FACTS & FICTION**—What are the facts about Russia at present? Since early 1950, Aviation Week has been sifting its material on the subject in rigorous fashion. As a result, not much material got through, and into print. Some readers have noticed, and asked why. "Inside stuff" is uncovered or offered to us both here and abroad, as it is to other publications. But since investigating we did over a year ago—and since—convinced us that extreme caution was necessary if we were not to be caught playing into the hands of propagandists and certain hungry news outlets.

One little group, for example, was selling Russian "diets" and sketches, some of which probably did come from reliable sources. But the material ran thin and we began to ask more questions. Adequate documenta-

tion was not forthcoming and we inserted a number of beautiful work drawings, most of which popped up later in other periodicals.

Last February, for example, another magazine published a page about two "new" Czech fighters that were "being built for the Russians." Our checking had already indicated that the original sketch of one of these specified Czech jets had appeared in the American magazine, Argus, late in 1948. Our own drawing had also indicated that this design had originated in a Czechoslovakian aviation magazine some months earlier. It had appeared in the April issue and readers of the latter language noted early that this was meant to be an April Fool feature. Yet this design of the April Fool sign still lives in the current literature about Russian aviation. We also recognize some Russian data which did remove our own checking and approval exclusively on Aviation Week. It requires to rewritten from here and there.

No serious publication is interested in radio-entertaining the Russians. Not is Aviation Week interested either, in overestimating them. What we are trying to get at, obviously, is the truth.

The New York Times military writer, Harrison Gold was, pointed out last week (July 24) that some military officers "stupidly challenge the facts published about Soviet air power—and Russian strength" in general—and decline that such service has used inflated and exaggerated estimates of Communist strength, first, to be on the safe side, and second, to support in the Pentagon and in Congress their own service estimates of their needs. These officers also are sharply critical of the point of view that Russia now is superior to the U.S. in the air. They even challenge the superiority of the MIG-15, the jet fighter used in Korea, and even that it achieves its higher speed and greater rate of climb at the expense of range. The constant exaggeration of Russian strength and the minimization of our own have inevitably weakened our diplomacy, these officers believe.

It is interesting to note, at this point, that when Aviation Week went directly to USAF intelligence officers to learn the background of Gen. Vandenberg's testimony that the MIG-15's powerplant was superior to anything the Air Force had in Korea, we learned (and were cleared to print it) that this assessment of superiority was based on what our Air Force thought the Reds would ultimately be able to pull out of this engine rather than on its present output. In other words, it will be better than our best Korean jet engine in use.

Some of the material being published about Russian air power undoubtedly has some degree of authenticity. Some of it—perhaps much of it—does not, and it is misleading. We are convinced that complacency in this country about the Russian menace would be disastrous. But the truth can best complementarity fully as well as overdone propaganda—and it isn't as likely to have that better chance.

—Robert H. Wood

EEMCO

technical bulletin

## Featherweight Linear Actuator for Jet Wing Flaps

Typical of EEMCO's forward-looking designs is a new linear actuator for jet aircraft wing flap systems developed in close cooperation with a leading air frame manufacturer.

Two actuators are interconnected by flex shafting. A single brake operated by either motor provides quick and accurate positioning for

systems—maintains it under all conditions of load and vibration. In case of emergency either actuator can safely operate the entire system under any condition of ambient temperature and under maximum load with a supply voltage as low as 20 volts. Entire assembly weighs only 8 pounds, 3 ounces.

## Actuator Screw Jack Data

Normal load 3000 lbs., 4 inches per sec. at 26 volts

Ultimate static load—ten thousand pounds compression in a fully extended position

Working stroke—5.14 inches

Non-jamming end stops

Provision for power takeoff or hand drive (right angle)

Radio noise filter for AN-M-40

Explosion proof construction

Weight—8 lbs., 3 ounces

Plans by faster, range farther. Today's impossible is practical tomorrow. EEMCO design and production contribute to building electrical actuates thought impossible just yesterday.

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# **FIRST U.S. Jet Engine approved for**

## **500 HOURS**

### **operating time between overhauls**

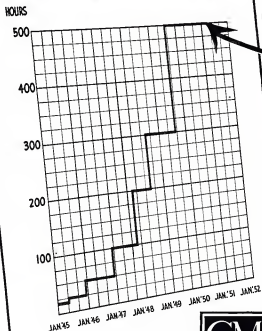
*by authority of Maintenance  
Division, Air Materiel Command,  
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**F**IVE hundred hours operation between major overhauls is now allowed on Allison J33 jet engines. At that time, if complete inspection shows engine meets required standards, an extension of 200 additional hours is authorized with periodic inspections. It is typical of Allison dependability that many J33 and J35 engines are operating 700 hours between major overhauls.

Behind this proof of dependable service stands good engineering and manufacture by Allison—plus excellent work by flying and maintenance personnel of the U.S.A.F. and Navy. Such a record would not be possible without the total experience of 800,000 hours flight time amassed by 10,000 Allison jet engines.

That is experience where it counts most—in the air—and another reason why Allison leads the field in both the breadth and depth of its turbine engine experience.

### **ALLISON J33 TURBO-JET AUTHORIZED TIME BETWEEN OVERHAUL**



Builders of Axial and Centrifugal Flow  
Turbine Engines—J33, J35 and the new J35 A-23.  
Also the T40 Series Turbo-Prop Engines

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